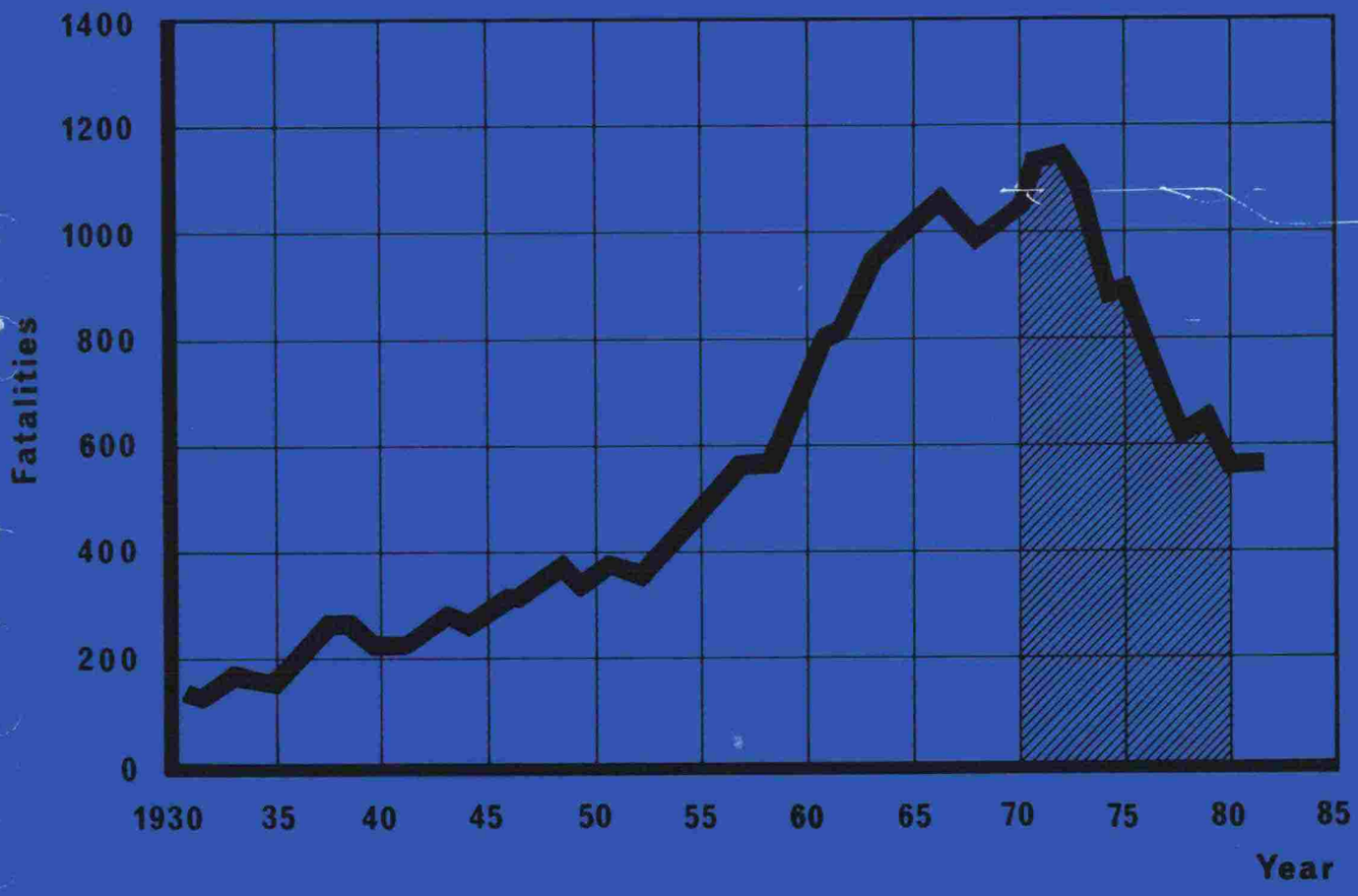
TRAFFIC SAFETY MEASURES IN FINLAND DURING THE 1970'S

MEASURES USED TO REDUCE THE NUMBER OF TRAFFIC FATALITIES BY 50 PER CENT



ROADS AND WATERWAYS ADMINISTRATION
TRAFFIC DIVISION
TVH 741802

HELSINKI 1982

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FOREWORD

The purpose of the study of traffic safety measures implemented in Finland during the 1970's was to collect the most important data on the development of traffic safety and affecting factors for the use of future traffic safety programs. The study is intended to help people involved in research and decision making as well as organizations responsible for traffic safety work. It is also hoped that the investigation would have value in the dissemination of information within international co-operation.

The study was made upon the commission of Traffic Department of Finland's Roads and Waterways Administration (RWA). The work was supervised by a group with Mr. Kirill Härkänen (Chief Engineer, Traffic Dept.) as chairman and Mr. Lasse Hantula, Association of Traffic Insurances, Mr. Olli Hintikka, Ministry of Tranportation and Communications, Mr. Martti Mäki, Liikenneturva, Mr. Reijo Naulapää, Ministry of the Interior, and Mr. Matti Roine, Traffic Department of Roads and Waterways Administration as members. Mr. Tapani Kokko of Viatek Oy was the secretary of the group. In addition to organizations represented in the group, the following organizations were contributing to the study: the Union of Finnish Cities, The Automobile Registration Centre, The Finnish Broadcasting Corporation, the Meteorological Institute, the National Board of Schools, the Finnish State Railways and the Association of Driving Schools.

CONTENTS

INTRODUCTION

Fatal Accidents, 1931 - 1981

In the seventies the trend in traffic safety in Finland was exceptionally favourable. During this period the number of people killed annually in traffic accidents decreased so that at the end ot the decade the numer of fatalities was only half of the number what it was in the beginning of the seventies. The reduction in the injury accidents was approximately the same. In the international comparisons at the end of the seventies Finland was considered among the leading countries in road safety.

The favourable trend was due to several underlying factors that can be found among various elements of traffic safety work, as well as to measures aimed at improving various traffic safety sectors. By collecting and storing data on the above mentioned factors and measures the causes of favourable development may be examined and the data used also in the coming years. As a consequence the most important and obvious factors influencing the favourable trend are examined in this report, although no estimates are made about the magnitude of importance of any individual measure.

The examination of influencing factors dates back to the 1960's, whereas traffic safety measures examined were all enforced in the 1970's. It has to be said that general changes in the influencing factors have not necessarily improved traffic safety. On the contrary, they may even have had an opposite effect. Only part of actual traffic safety measures are serving exclusively traffic safety and many measures were even based on other goals such as improving the flow of traffic. One must also notice that all factors affecting traffic safety cannot be measured directly. These include among others the emergence of generation accustomed to traffic, general changes in the attitudes and public debate about traffic safety.

The study attempts to discuss as many important factors and measures as possible. For practical reasons, for instance, measures implemented by organizations with indirect effect on traffic safety could not be included. The work of automobile associations, Finnish Red Cross, Road Service, the press and temperance associations, among others, was excluded from this investigation. Further, the collection of data on traffic safety measures effected by municipalities proved to be particularly problematic.

1. DEVELOPMENT OF TRAFFIC SAFETY

1.1
INTERNATIONAL COMPRISONS

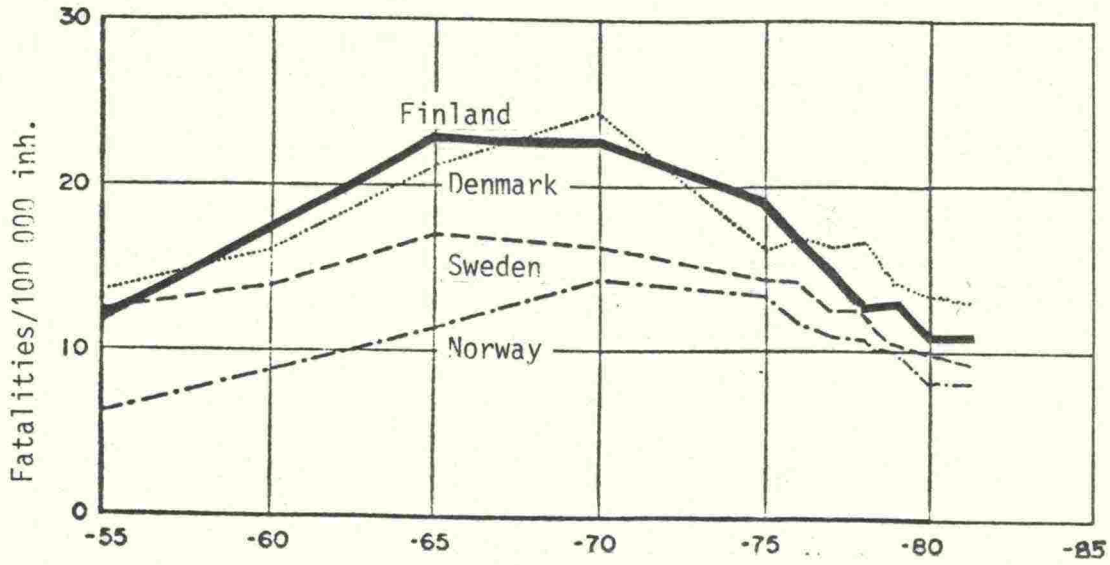


Fig. 1.11

Fatal Accidents/100 000 inhabitants, Finland and Nordic Countries

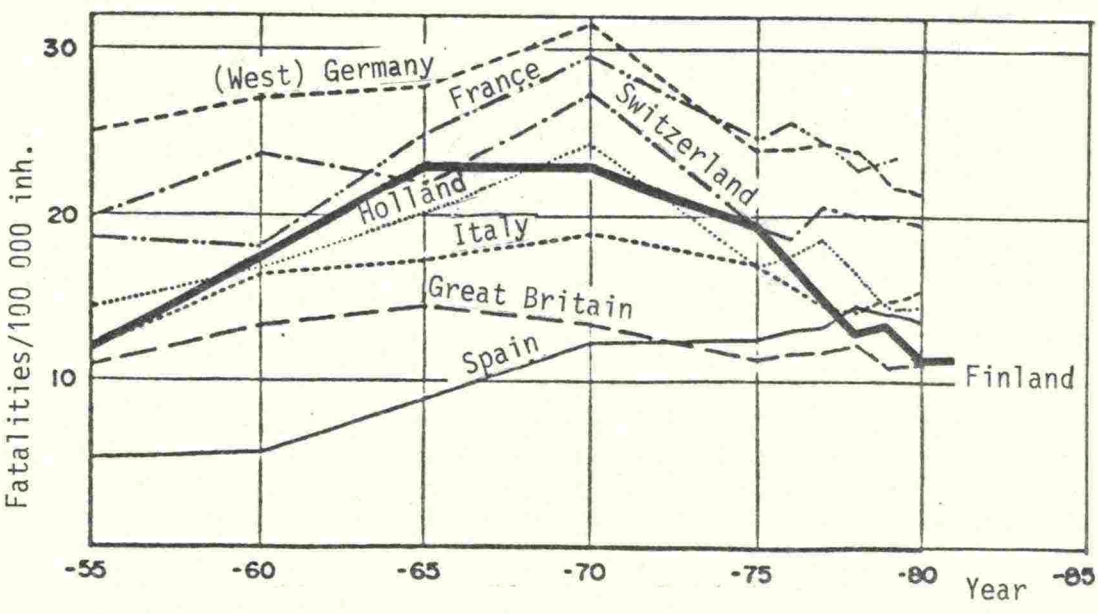


Fig. 1.12

Fatal Accidents/100 000 inhabitants, Finland and Europe

1.2
RECORDING OF TRAFFIC ACCIDENTS

Development of Traffic Accident Records

1931 The Office of Social Research started to issue statistics on traffic accidents informed to Police in its publication the "Sosiaalinen Aikakauskirja".

1941 The records were extended to include also other than motor vehicle accidents.

1954 TALJA (Central Organization for Traffic Safety) started the publication the "Road Traffic Accidents in Finland" based principally on the road traffic accident records of the Central Statistical Office.

1966 The statistical bulletins of the Central Statistical Office took over the publication of traffic accident statistics from the "Sosiaalinen Aikakauskirja".

1967 The Traffic Planning Department of Helsinki City Planning Office started to record the development of traffic safety.

1967 The Traffic Safety Commission of Insurance Companies (VALT) started to publish an annual statistical booklet the "Average Damage Statistics of Traffic Insurance Companies".

1967 Finland's Roads and Waterways Administration started to record traffic accidents on public roads.

1973 A new accident reporting form for traffic and automobile insurance companies was adopted for VALT which is identical with the new reporting form of the Police.

1974 The Traffic Accident Statistics Commission of Ministry of Transportation and Communications investigated possibilities to improve accident recording. According to municipal interviews 27 municipalties kept their own records and at least 40 municipalities received necessary information from the local police authorities.

1978 Traffic accident report directions for the Police were clarified.

1982 Instructions for the use of the road traffic accident report form were clarified.

This report discusses the development of traffic safety in the 1970's on the basis of the accident records of the Central Statistical Office, Finland's Roads and Waterways Administration, Motor Insurance Associations and the City of Helsinki.

Traffic Accident Records

The Central Statistical Office maintains the official traffic accident records, which cover all public roads and streets. The Statistics is prepared annually and it contains all accidents, which result in personal injury and are reported to the Central Statistical Office by the Police.

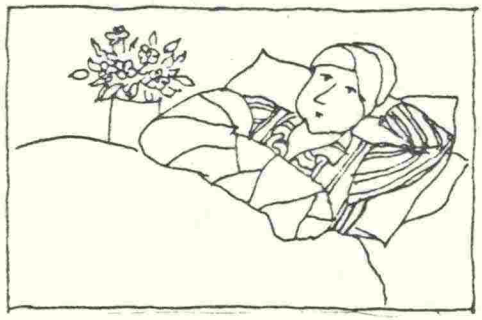
Insurance companies have a traffic safety commission, which prepares the traffic damage statistics of the insurance companies. It is based on the damaged accident reports from the traffic insurance policy holders. The statistics include numerous accidents not reported to the Police.

Finland's Roads and Waterways Administration keeps a road traffic accident record which is based on accident reports from the Police. It only covers accidents on public roads and is intended to serve road and traffic planning and engineering as well as road maintenance and construction purposes.

Liikenneturva, the central organization of traffic safety in Finland, also prepares an advance statistics of accidents resulting in personal injury. It is based on advance information send to Liikenneturva by the Police.

Coverage of Different Records

Of all accidents occurring annually 20 - 29 % are reported to the Central Statistical Office. The statistics of the Office contain all fatal accidents and 50 -65 % of accidents resulting in injuries. The statistics of Finland's Roads and Waterways Administration contain about 35 - 37 % of accidents on public roads; nearly 100 % of fatal accidents, 60 - 65 % of injury accidents and 26 - 30 % of property damage accidents. About 78 % of all accidents are reported to insurance companies by the traffic insurance policy holders. Of fatal accidents more than 90 % are reported to insurance companies. The percentage for injury accidents is 83 - 90 % and for property damage accidens 76 - 78 %. About 20 % of all accidens remain outside the statistics, the percentage for injury accidents is 7 -14 % and for property damage accidents 21 - 26 %.



1.3
FATAL AND INJURY ACCIDENTS ACCORDING TO CENTRAL STATISTICAL OFFICE

Fig. 1.31

FATAL ACCIDENTS

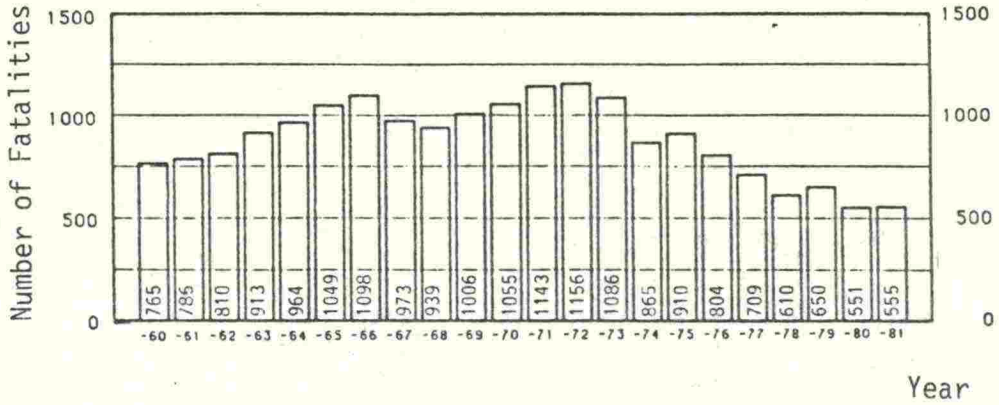
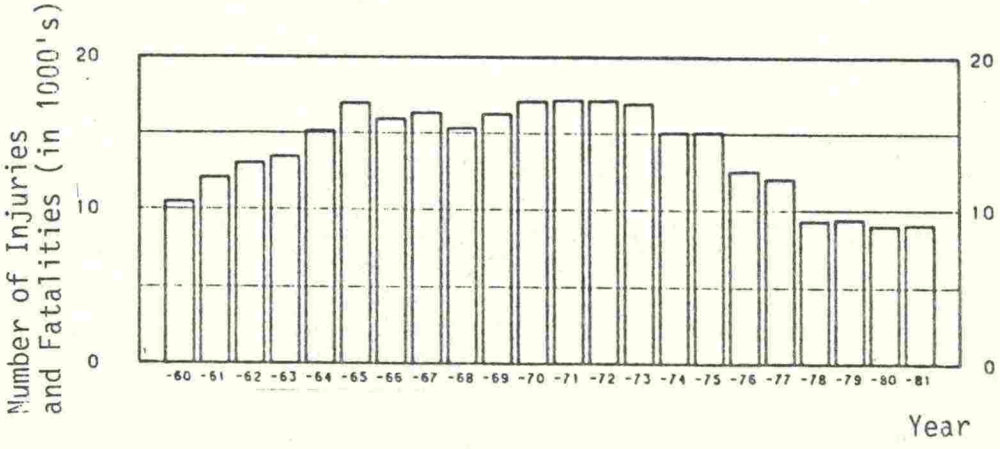


Fig. 1.32

FATAL AND INJURY ACCIDENTS



1.4
TRAFFIC ACCIDENTS ACCORDING TO INSURANCE COMPANY STATISTICS

Fig. 1.41

ACCIDENTS REPORTED TO INSURANCE COMPANIES

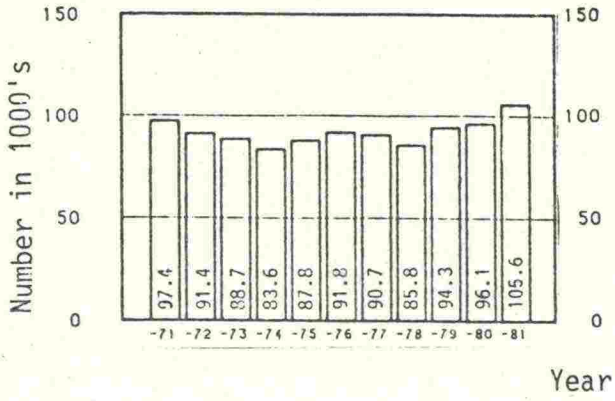
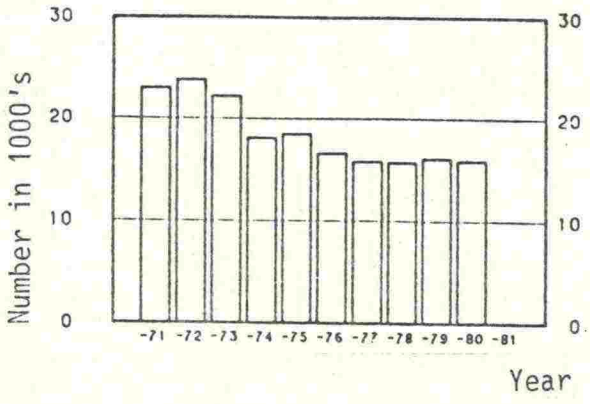


Fig. 1.42

FATALITIES AND INJURIES COVERED BY MOTOR VEHICLE INSURANCE POLICIES



1.5
TRAFFIC ACCIDENTS ACCORDING TO RECORDS OF FINLAND'S ROADS AND WATER-WAYS ADMINISTRATION

Fig. 1.51

FATALITIES IN ROAD TRAFFIC ACCIDENTS

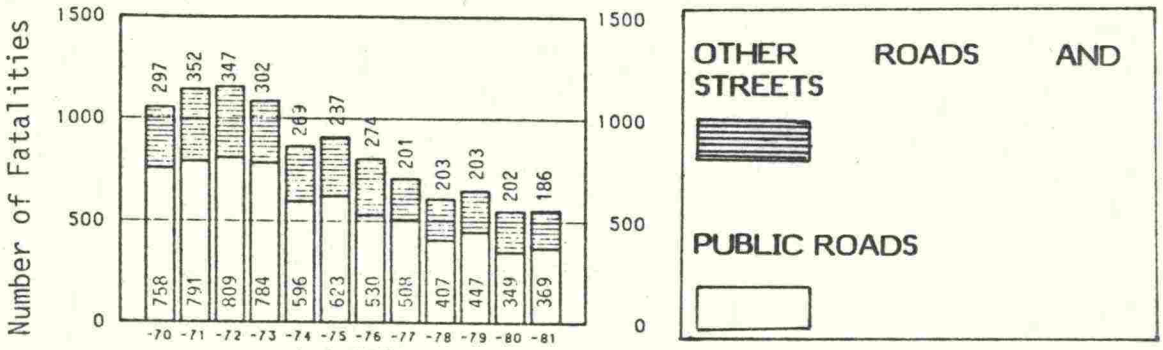


Fig. 1.52

INJURY ACCIDENTS ON PUBLIC ROADS

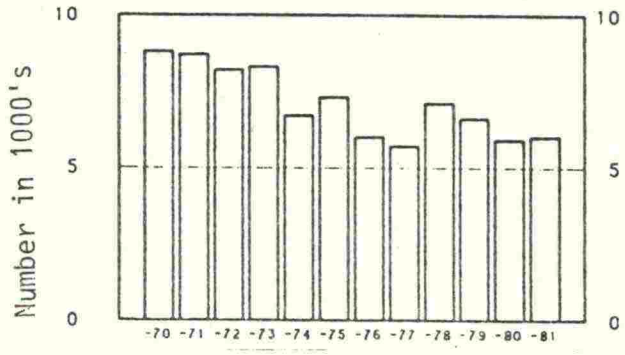
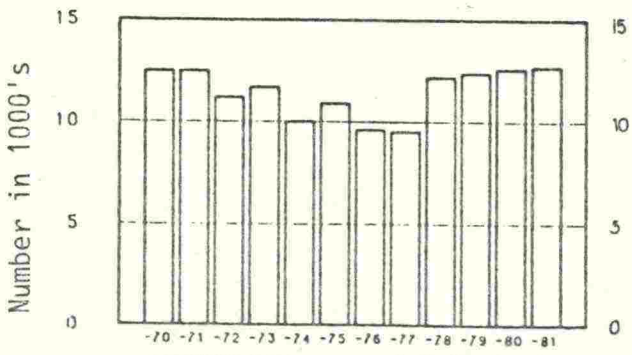


Fig. 1.53

TRAFFIC ACCIDENTS ON PUBLIC ROADS



1.6
TRAFFIC ACCIDENTS ACCORDING TO RECORDS OF HELSINKI

Fig. 1.61

FATAL ACCIDENTS IN HELSINKI

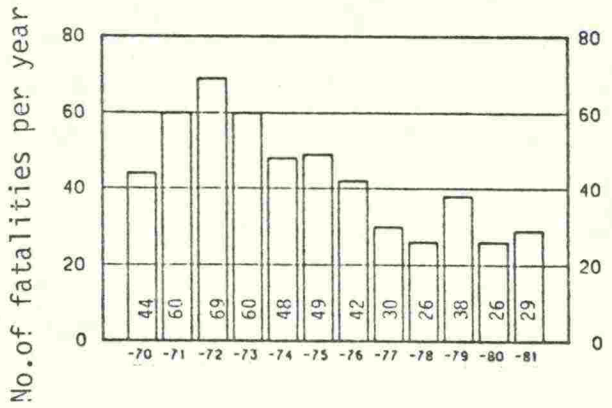


Fig. 1.62

FATAL AND INJURY ACCIDENTS IN HELSINKI

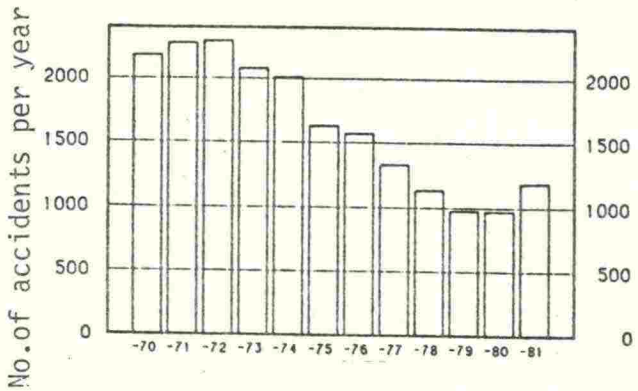
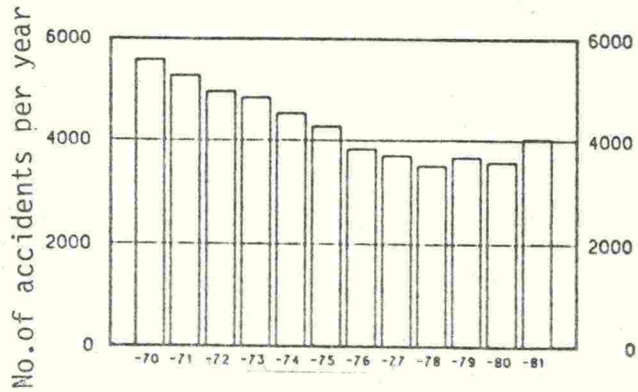


Fig. 1.63

ALL ACCIDENTS IN HELSINKI



1.7
TRENDS OF CERTAIN ACCIDENT TYPES

Fig. 1.71

FATAL ACCIDENTS ON PUBLIC ROADS
WINTER

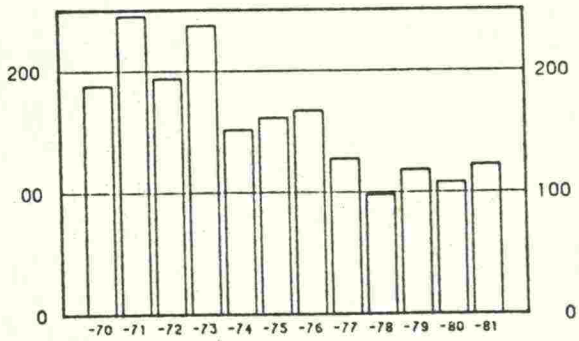


Fig. 1.72

FATAL ACCIDENTS ON PUBLIC ROADS
DARK

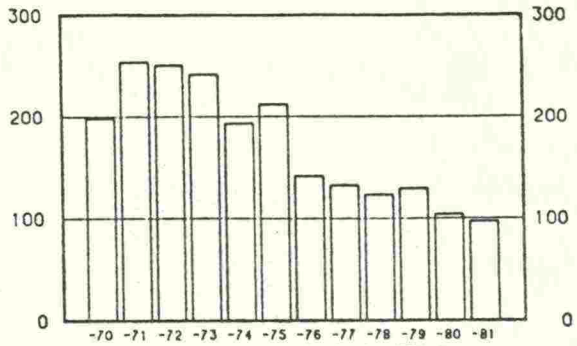


Fig. 1.73

ACCIDENTS ON PUBLIC ROADS
INTERSECTIONS

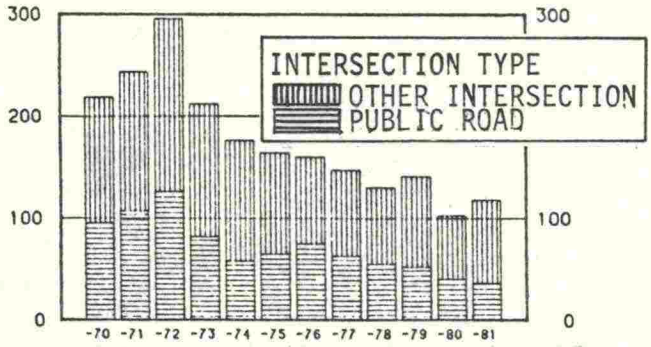


Fig. 1.74

ACCIDENTS ON PUBLIC ROADS
SINGLE VEHICLE

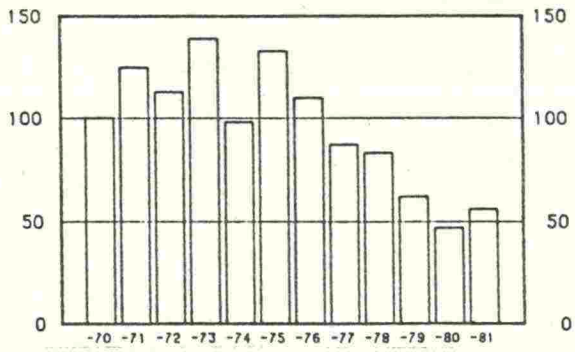


Fig. 1.75

FATAL ACCIDENTS ON PUBLIC ROADS
ALCOHOL

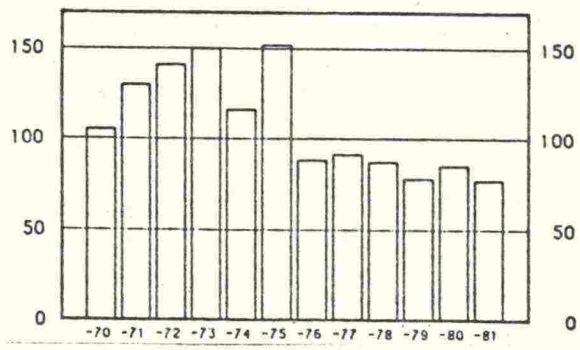


Fig. 1.76

FATAL ACCIDENTS BY VEHICLE TYPES
(ROADS AND STREETS)

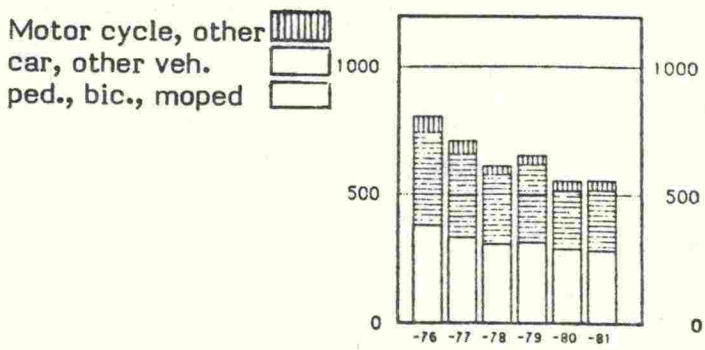


Fig. 1.77

BICYCLE AND PEDESTRIAN ACCIDENTS ON PUBLIC ROADS

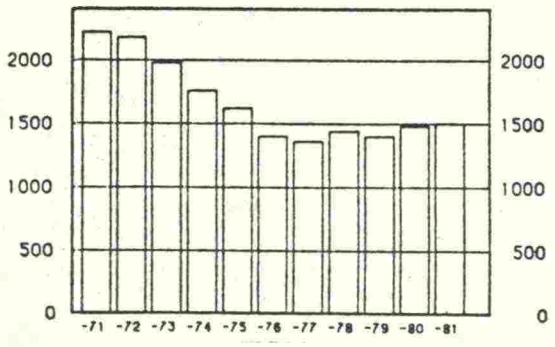


Fig. 1.78

ACCIDENTS ON BRIDGES OF PUBLIC ROADS

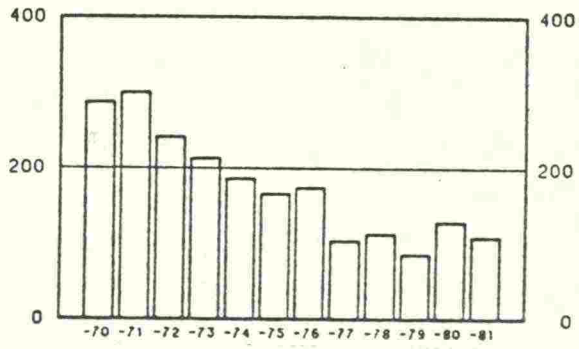


Fig. 1.79

ANIMAL (MOOSE) ACCIDENTS

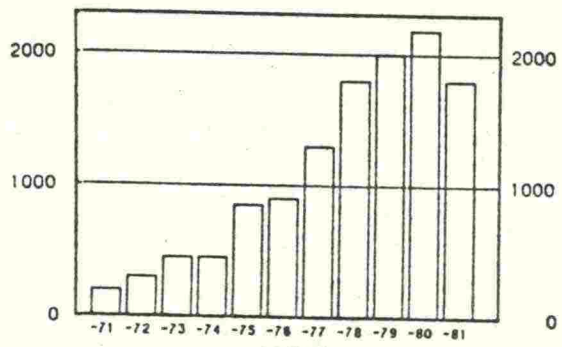


Fig. 1.710

ACCIDENTS AT RAILWAY GRADE CROSSINGS
(ALL GRADE CROSSINGS, STATE RAILWAYS STATISTICS)

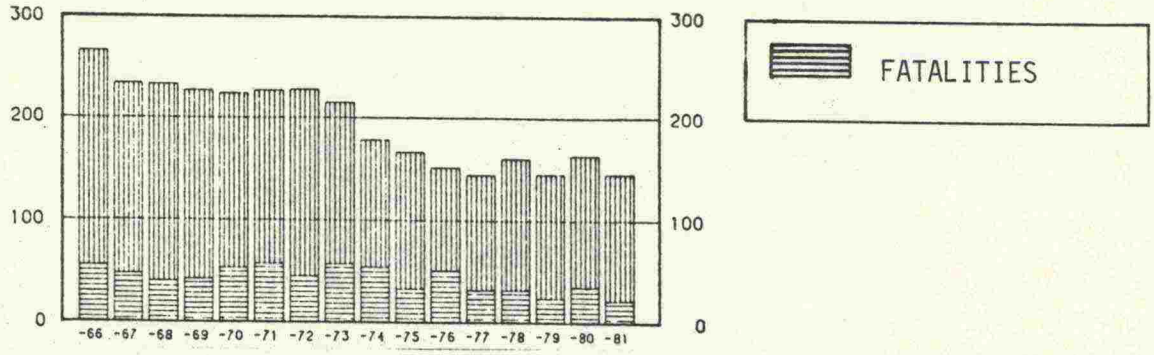


Fig. 1.711

TRAFFIC ACCIDENTS AT RAILWAY GRADE CROSSING OF PUBLIC ROADS

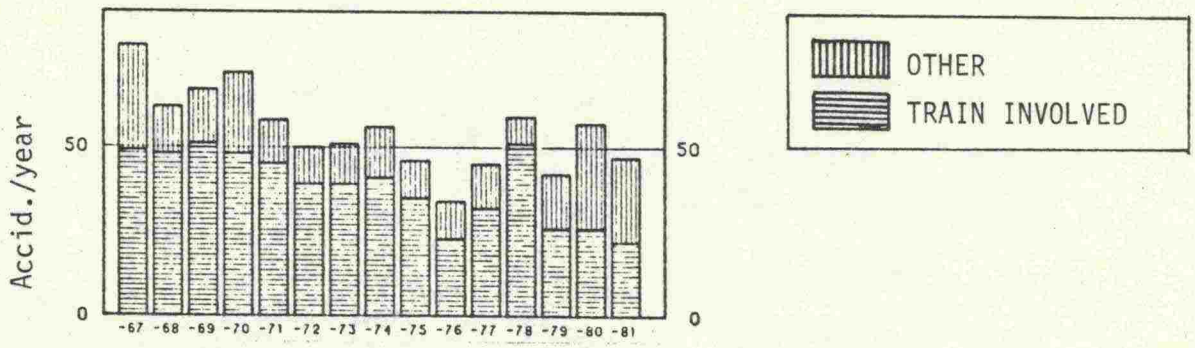
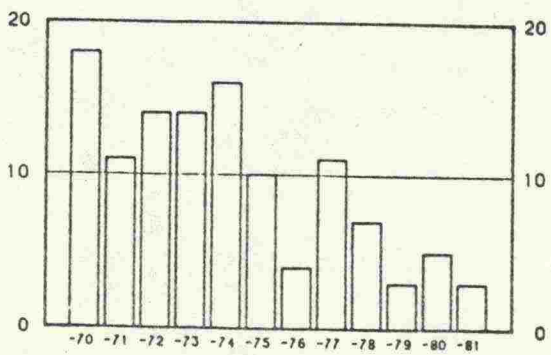


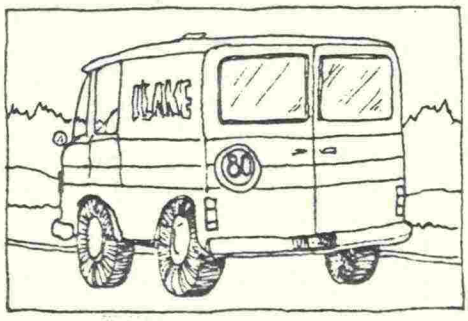
Fig. 1.712

FATAL ACCIDENTS AT RAILWAY GRADE CROSSINGS OF PUBLIC ROADS



During 1974 - 1978 accidents at grade crossing of public roads and railways accounted for 30 % of all railway grade crossing accidents.

2. UNDERLYING FACTORS OF TRAFFIC SAFETY DEVELOPMENT



2.1
MOTOR VEHICLE REGISTRATION

Fig. 2.11

REGISTERED AUTOMOBILES, 1960 - 80

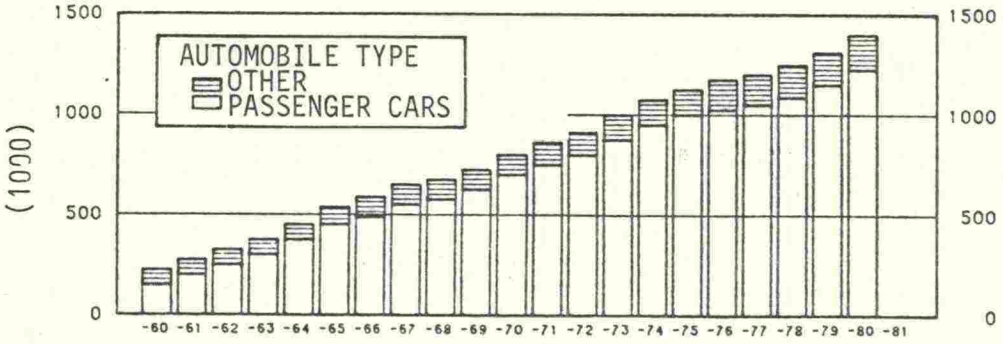


Fig. 2.12

PASSENGER CAR OWNERSHIP

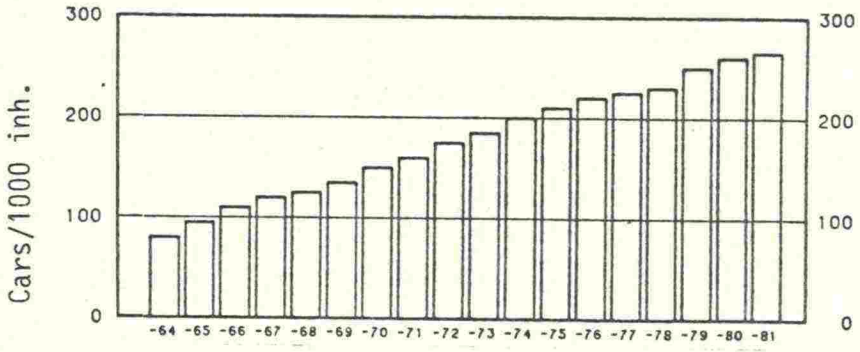
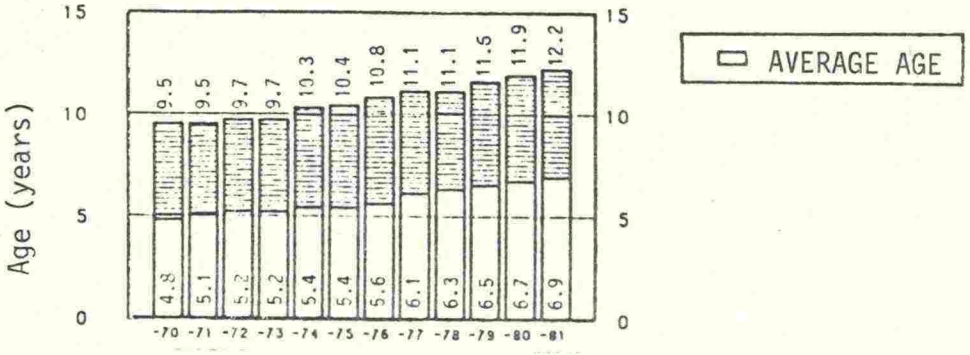


Fig 2.13
AUTOMOBILE LIFE AND AVERAGE AGE



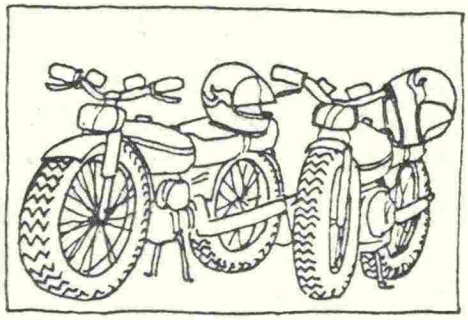


Fig. 2.14

FIRST REGISTRATION OF CARS

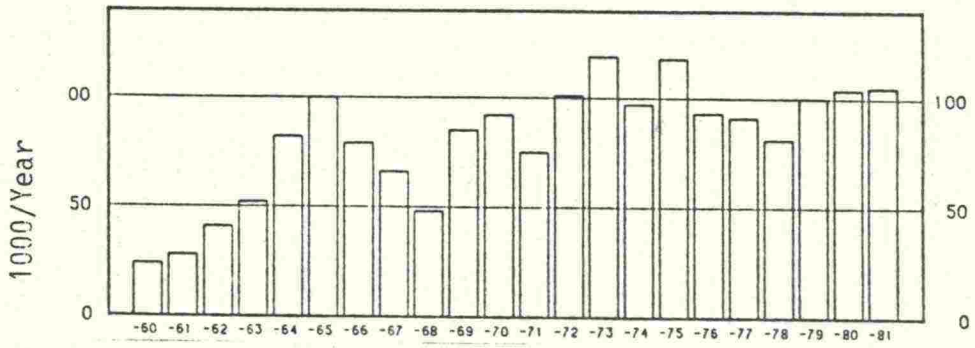
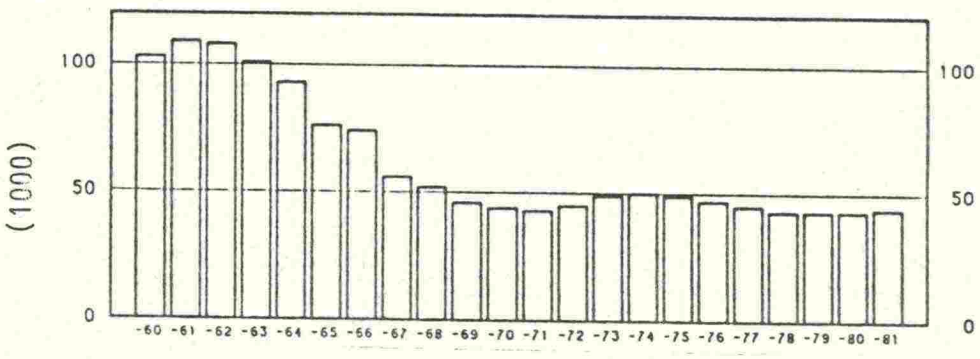


Fig. 2.15

REGISTERED MOTOR CYCLES



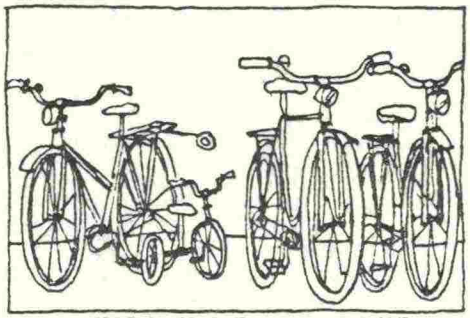


Fig. 2.16

BICYCLE SALES

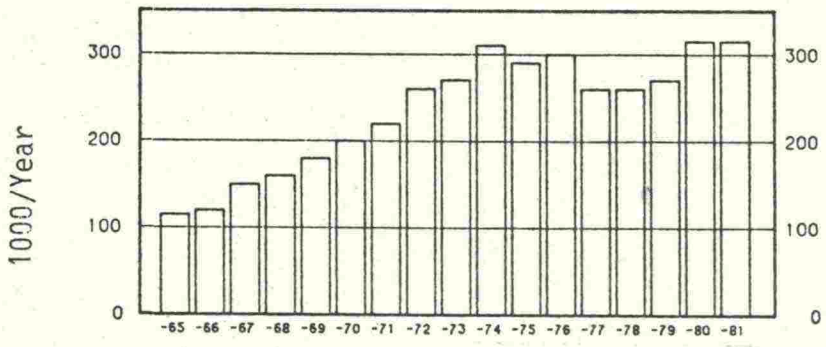
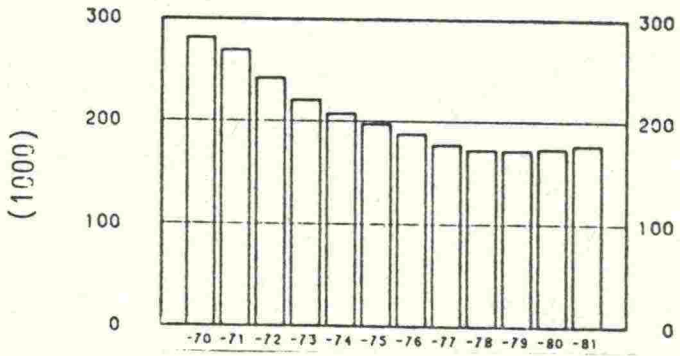
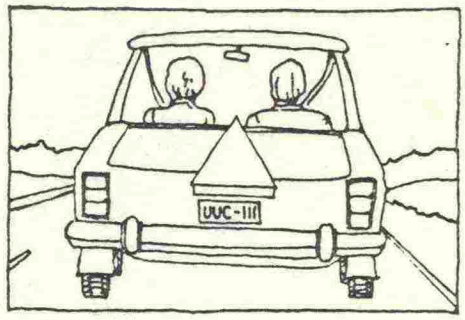


Fig. 2.17

NUMBER OF MOPEDS





2.2
DRIVER'S LICENCES

Fig. 2.21

NEW DRIVER'S LICENCES

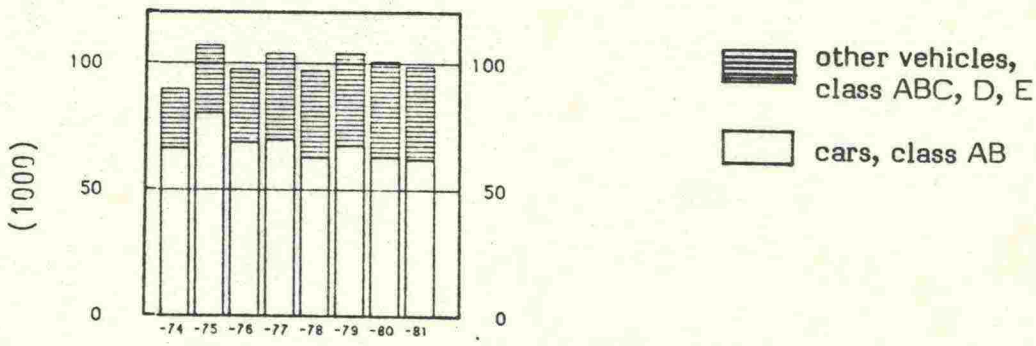


Fig. 2.22

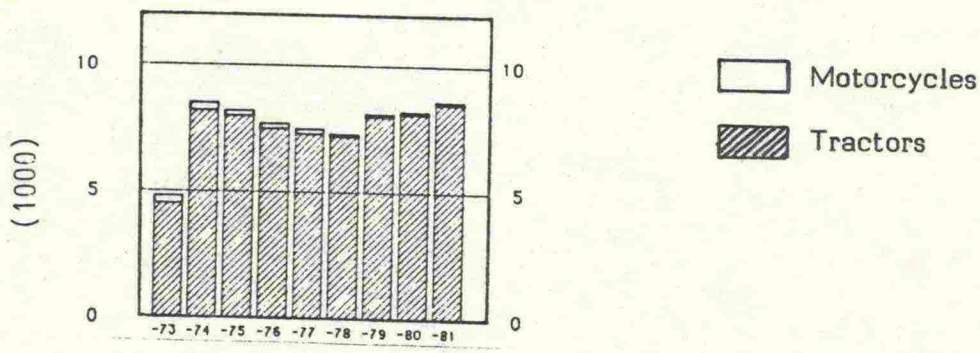
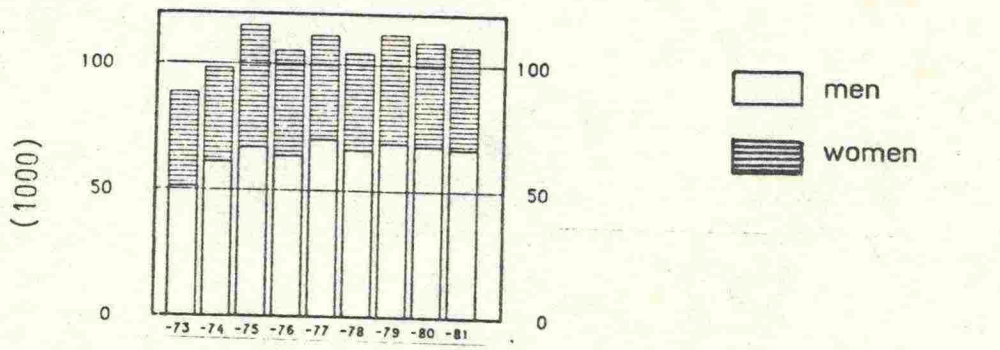


Fig. 2.23



The total number of dirver's lincences in 1980

Men	1 260 000
Women	710 000
Total	1 970 000

The average age of the driver's licence holders in 1970 was about 33 years and in 1980 36,8 years.

2.3
POPULATION GROWTH, ECONOMIC DEVELOPMENT AND TRAFFIC VOLUME

Fig. 2.31

POPULATION

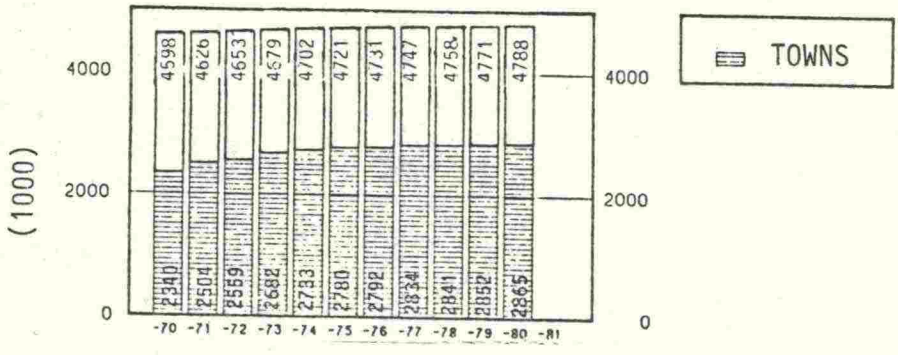


Fig. 2.32
GROSS NATIONAL PRODUCT
AT 1975 PRICE LEVEL

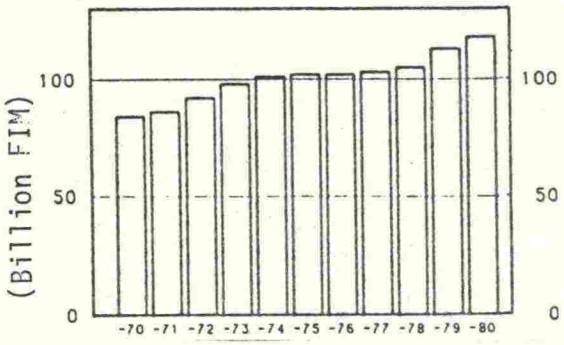
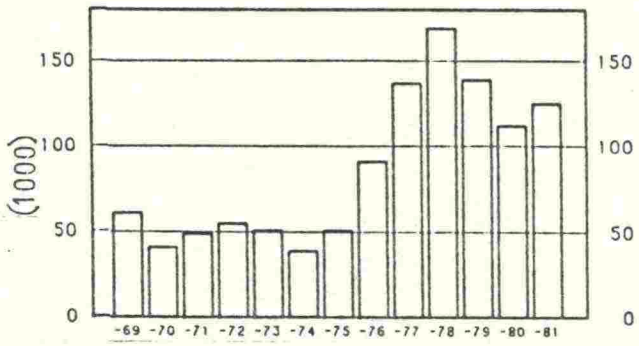
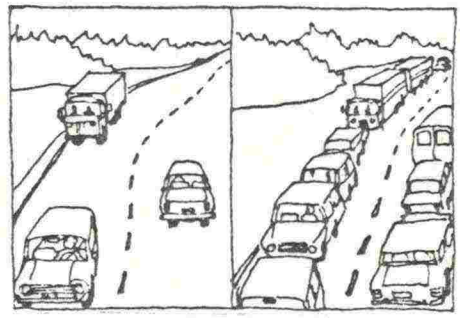


Fig. 2.33
UNEMPLOYMENT





In 1975 the volume of traffic on streets represented about 21 % of the total traffic volume. Including public roads the volume of traffic in urban areas was 46 % of the total traffic volume. The respective route length in urban areas was 23 % of the total. The cities accounted for 32 % of the public road traffic volume.

Fig. 2.34

TRAFFIC VOLUME ON ROADS AND STREETS

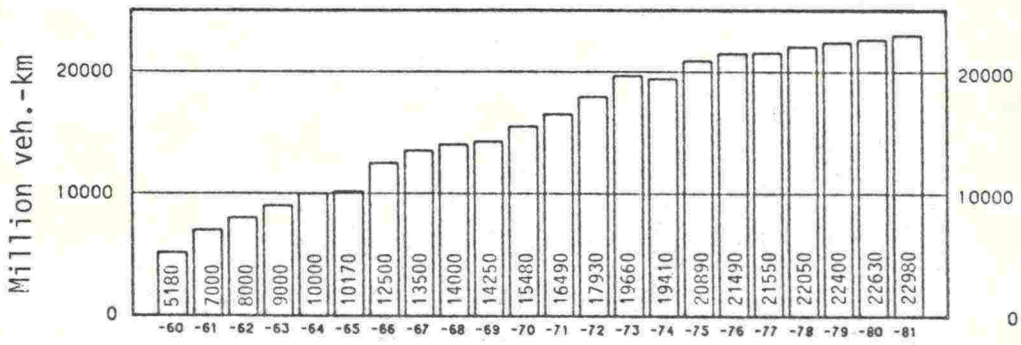
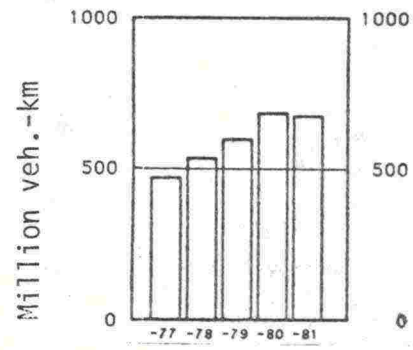


Fig. 2.35

TRAFFIC VOLUME OF TRUCK TRAILERS ON PUBLIC ROADS



Proportional Growth of Bicycle and Pedestrian Traffic

In 1974 bicycle trips accounted for 11.8 % of all trips. The percentage for 1980 was 16.5 %.

In 1974 bicycle traffic accounted for 2.5 % of all traffic. The percentace for 1980 was 3.9 %.

Changes in Recreation Traffic

In 1974, recreation trips were 19.3 % of all trips. The percentage for 1980 was 23.6 %.

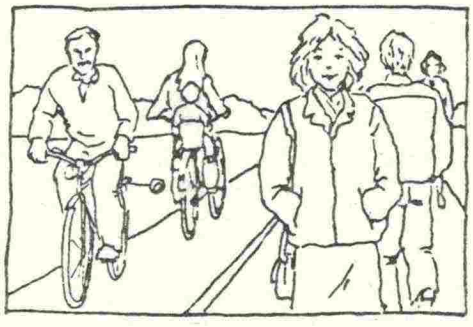
In 1975 weekend traffic was 40.2 % of the weekly traffic. The percentage for 1981 was 35.5 %.

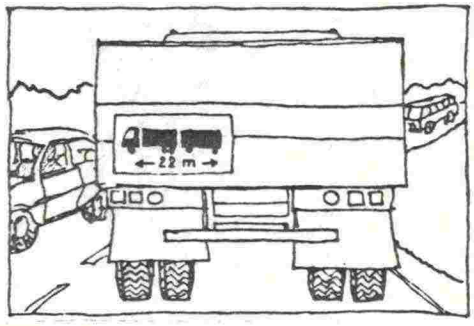
The seasonal variation coefficient of traffic (ADT of summer/ADT) was 1.44 in 1975 and 1.29 in 1980.

Special Transports and Accidents

1970	110 000	special transport operatons
1975	200 000	- " -
1980	250 000	- " -

Annually 3 - 4 persons will be killed and 40 - 50 people injured in traffic accidents involving special transports.





2.4
VEHICLE SPEED ON MAIN ROADS IN SOUTHERN FINLAND

Fig. 2.41

AVERAGE SPEED OF CARS

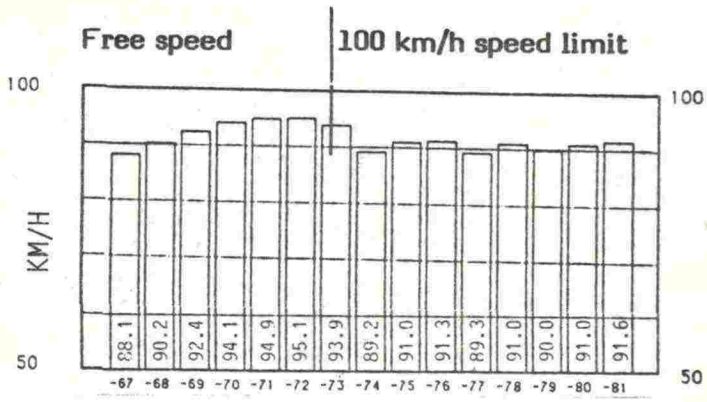


Fig. 2.42

TRUCK TRAILERS; THE SPEED WHICH 15 % OF VEHICLES EXCEED

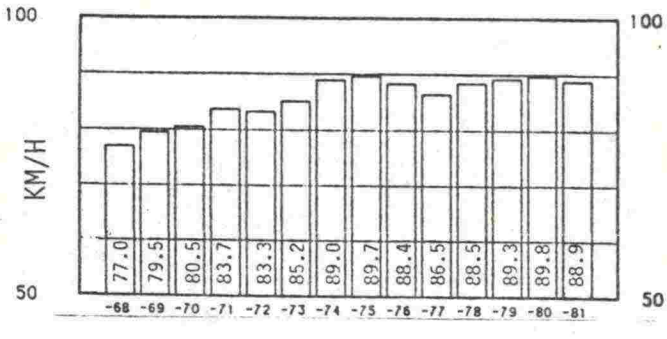
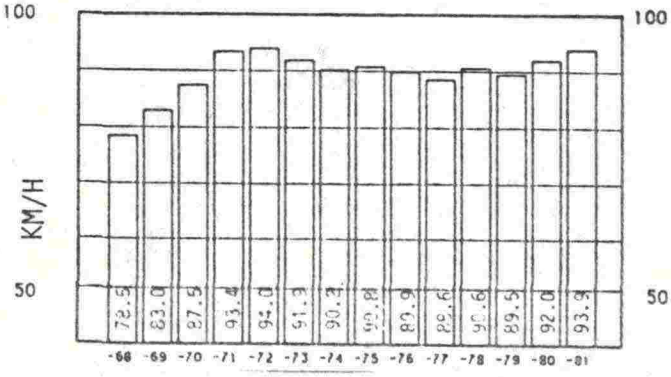


Fig. 2.43

BUSES; THE SPEED WHICH 15 % OF VEHICLES EXCEED



2.5
FUEL SALES AND PRICES

Fig. 2.51

SALES OF CASOLINE

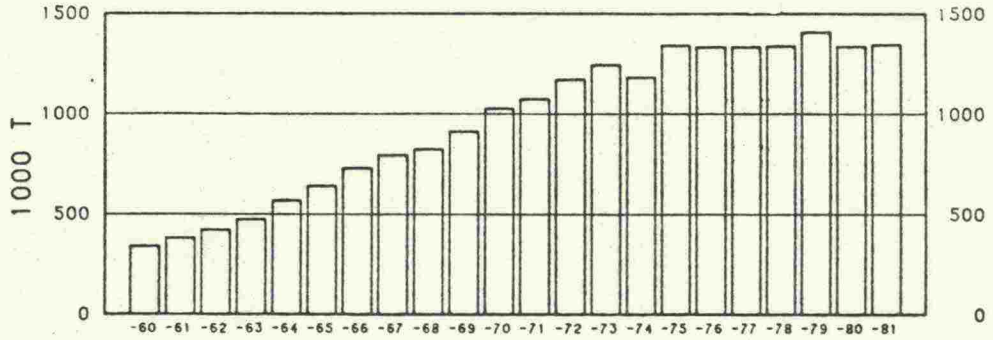


Fig. 2.52

COMSUMPTION OF DIESEL FUEL

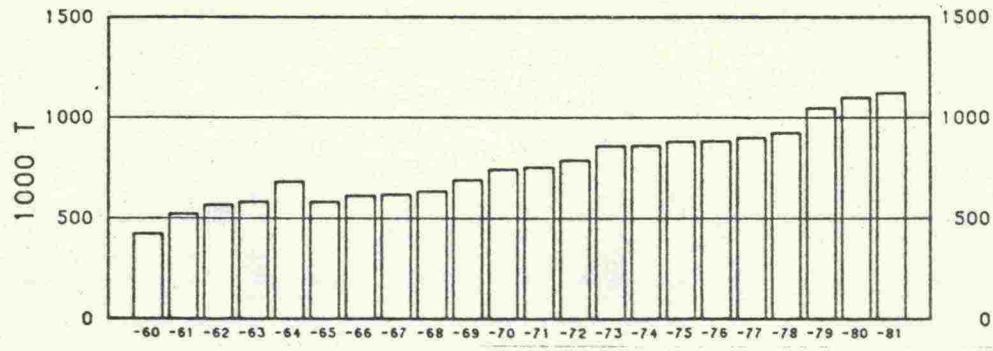


Fig. 2.53

CONSUMER PRICE OF GASOLINE

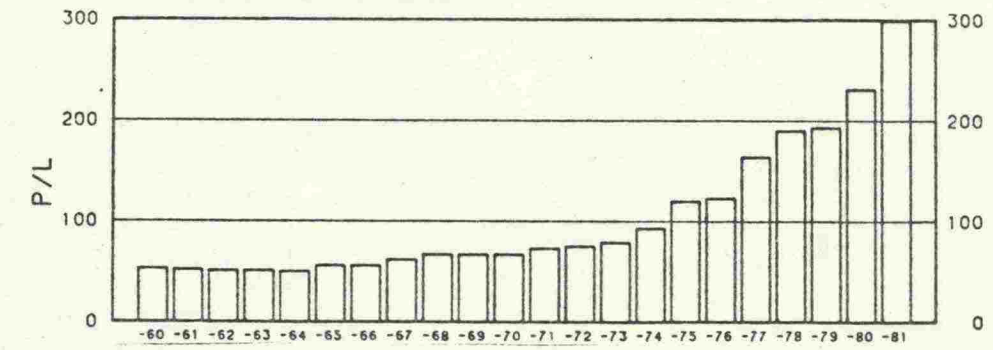
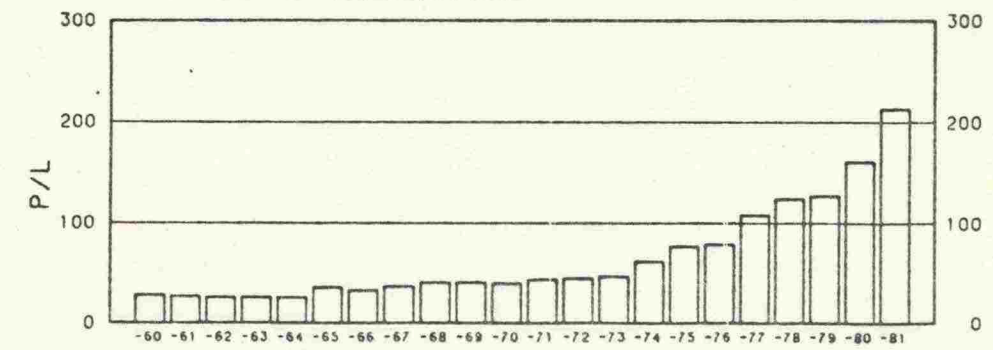


Fig. 2.54

CONSUMER PRICE OF DIESEL FUEL



2.6
OTHER RELEVANT FACTORS

Fig. 2.51

VOLUME OF ALCOHOL SALES
(IN 100 % ALCOHOL)

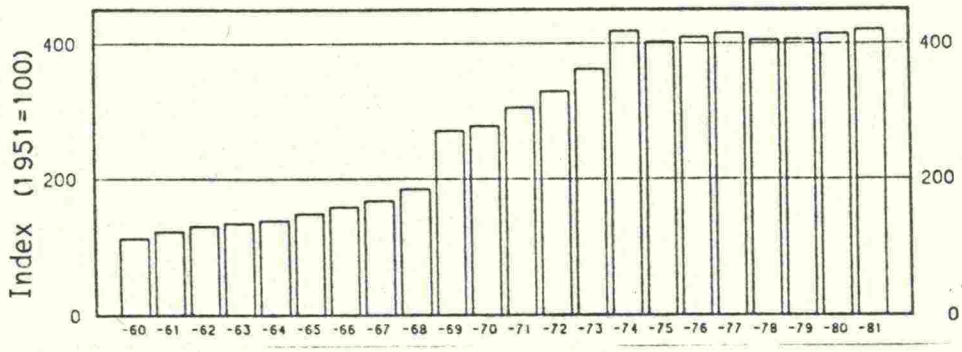


Fig. 2.52
CONSUMPTION OF ALCOHOL
(IN 100 % ALCOHOL)

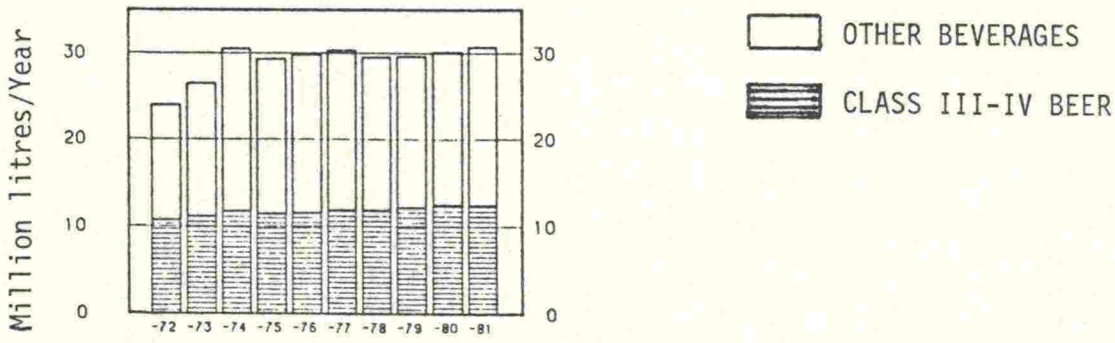
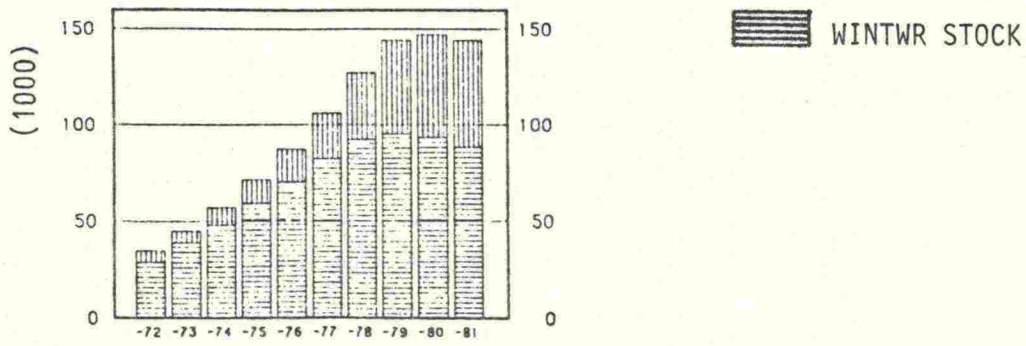


Fig. 2.53
MOOSE STOCK IN AUTUMN



Radiotelephones on vechiles

In 1982 there were radiotelephones in about 30 000 motor vechiles.

2.7
DEVELOPMENT OF ROAD AND STREET NETWORK

Length and widht of public roads

Fig. 2.71

PUBLIC ROADS

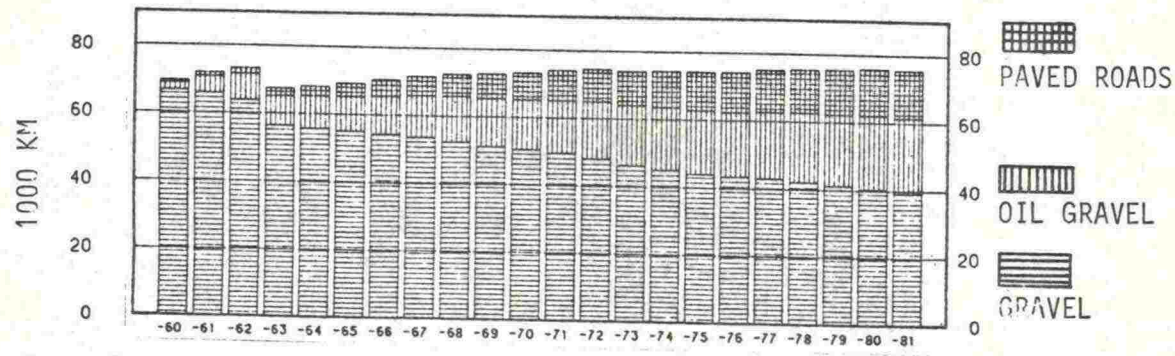


Fig. 2.72

PUBLIC ROAD WIDTHS

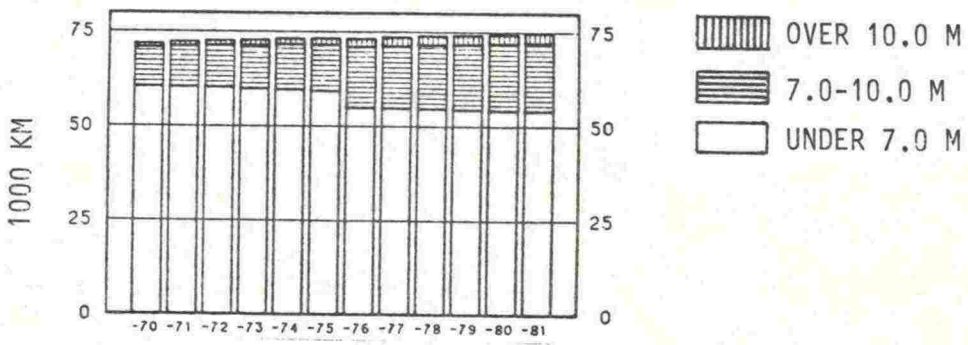
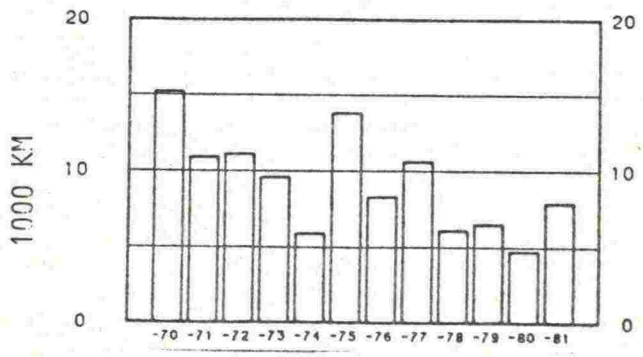


Fig. 2.73

TRAFFIC RESTRICTIONS DURING SPRING THAW PERIOD

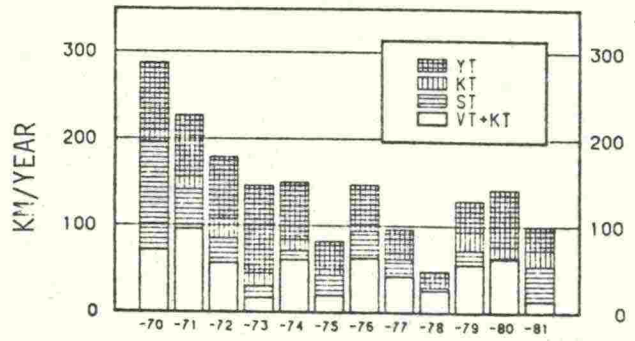


In 1980 there were 331 km of divided highways in the country.

Construction and Improvement of Public Roads

YT	=	Local Road
KT	=	Collector Road
ST	=	Regional Road
VT + KT	=	Primary and Secondary Road

Fig. 2.74
NEW ROAD CONSTRUCTION



Bypass roads have been built for several urban centres. The exact number of bypass roads is not known.

Fig. 2.75
ROUTE RELOCATION OF EXISTING ROADS

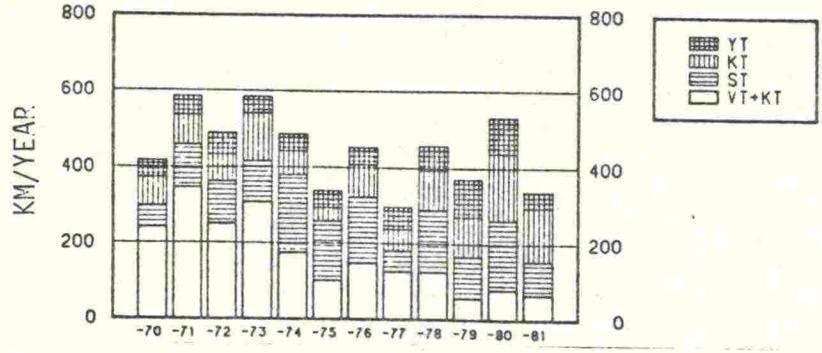
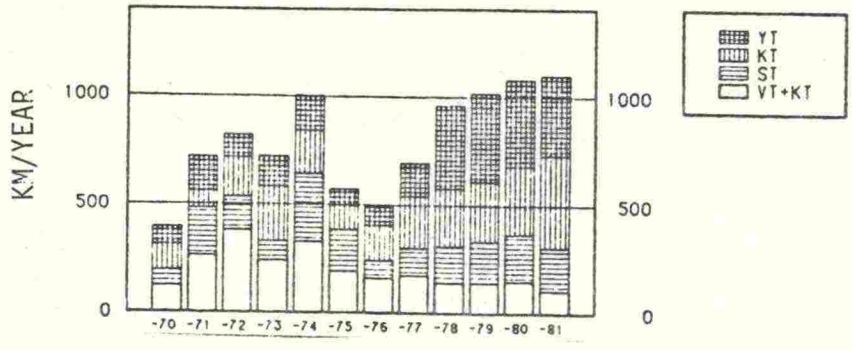


Fig. 2.76
STRUCTURAL IMPROVEMENT OF EXISTING ROADS

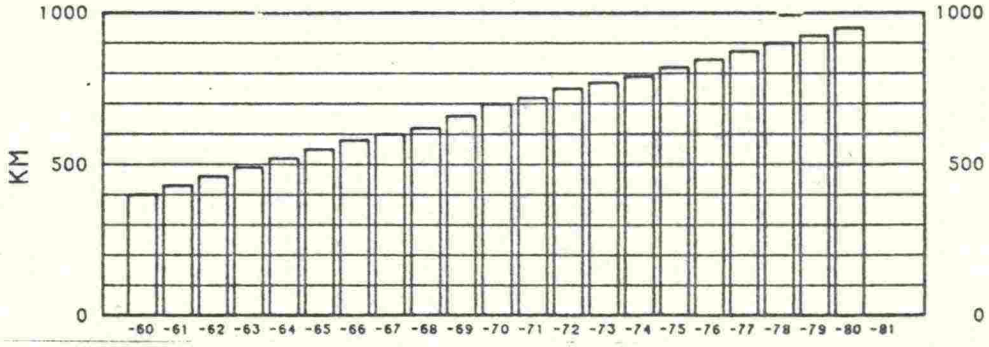


Growth of Urban Street Network

Total lenght of streets in	1976	5 300 km
- " -	1970	6 100 km
- " -	1975	7 600 km
Street network in 1980 according to other statistics		7 700 km

Fig. 2.77

TOTAL LENGHT OF STREETS IN HELSINKI



2.8
DEVELOPMENTS IN MEDICAL TREATMENT

The medical treatment of people injured in traffic accidents has developed along with the general development of medicine. The treatment of fractures and soft-tissue damages, among others, is now much more efficient than at the beginning of the seventies. Brain damages and multiple injuries from traffic accidents have decresased the most. The increased use of safety belts is considered to be the most important reason contributing to the decrease.

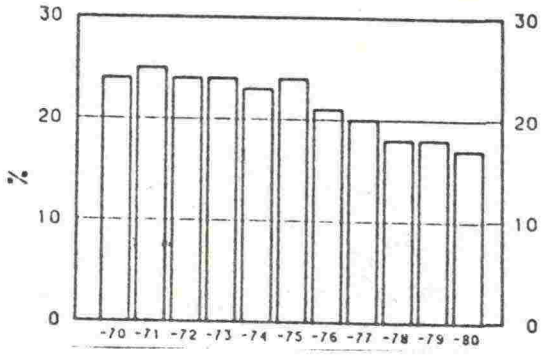
Emergency calls and transportation have been expedited by better signing of first aid stations, increased use of two-way radios and the provision of certain road sections with emergency telephones.

The Finnish Red Cross, among others, trains first-aid personnel as well as participates in emergency service work.

The Road Service Associations provide assistance on the road.

Fig. 2.80

TRAFFIC ACCIDENT PATIENTS
(% OF ALL ACCIDENT PATIENTS)



2.9
MEASURES FOR ORGANIZING TRAFFIC SAFETY WORK

1939	Merger of Traffic Culture Committee into the Association for the Prevention of Accidents results in the estabilishment of Talja, an organization for traffic safety work in Finland.
1950's	Insurance companies started traffic safety work among their policy holders
1964	Systematic traffic safety work was started by Roads and Waterways Administration
1967	Traffic safety work was extended to cover the entire Roads and Waterways Administration and co-operation with other organizations was initiated
1.1.1967	The Traffic Safety Commission of Insurance Companies - VALT - was estabilished within the Motor Insurance Association to carry out mutual traffic safety work for the companies. VALT participated in the work through traffic safety research, making proposals and giving statements on traffic safety matters and by disseminating information.
1968	The first traffic accident investigation board was estabilished in the Province of Uusimaa. The investigation board work is supervised by VALT. The VALT Negotiating Board, the VALT Scientific Group and supervisors of research projects provide expertise. The Negotiating Board is composed of the representatives of the concerned organizations while the Scientific Group of the representatives of universities.
6.6.1968	The Vehicle Repair Commission, VAT, of the Insurance Companies started its work.
1971	Traffic accident investigation boards were estabilished in all provinces by June, 1971
22.10.1971	Liikenneturva, Central Organization for Traffic Safety Work, was established to continue the work of Talja
1972 - 73	The Traffic Safety Section of the Parliamentary Traffic Commission prepared a traffic safety report
1973	Traffic safety research was started in the Road and Traffic Laboratory of the Technical Research Centre of Finland.
1973	Two positions of traffic safety inspectors were initiated within Ministry of Transportation and Communications
19.1.1973	Traffic Safety Commission was estabilished for Ministry of Transportation and Communications as a consulting body. It is composed of the representatives of political parties, goverment officials and research personnel

19.10.1973 Statue of January 1st, 1974, defined the position and charter of the central traffic safety organization that had assisted Ministry of Transportation and Communications. The tasks of the organization were defined in the statute. Public authorities and political parties were entitled to appoint their representatives to the organization. The organization financing is subject to the control of the Ministry.

1.3.1974 The Road Traffic Section of Ministry of Transportation and Communications was divided into three bureaus, the General Bureau, the Technical Bureau and the Traffic Safety Bureau. Excluding vehicle technology and inspection all other road traffic safety matters of the Ministry were assigned to the Traffic Safety Bureau

1.10.1975 The organization of Finland's Roads and Waterways Administration was reformed. A Traffic Bureau with a Traffic Safety Section was established

1976 The City of Helsinki established a Commission for Investigating Accident Damages

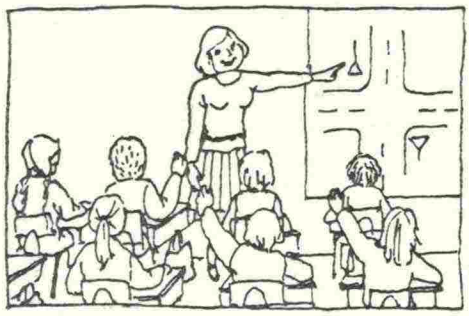
1982 Most insurance companies have full-time traffic safety officials and traffic safety negotiating boards.

3. MEASURES AIMED AT ROAD USERS

3.1
ROAD TRAFFIC LEGISLATION

1957	Act and Statute on Road Traffic
1968	Driving outside the pavement edge line was prohibited
6.3.1970	Finland's Roads and Waterways Administration has a permit to erect yield and stop signs on private roads
1.9.1970	A fine for parking violations adopted
	An advance warning triangle must be used if there is one in the vehicle
1.7.1971	A pedestrian crossing only at marked locations
	Stricter traffic laws reative to pedestrian crosswalks
	Turning motor vechicles must yield to bicycles and mopeds driving straight at intersections.
	Obligation to stop was removed from vehicles coming from a private area
1.7.1982	A 80 km/h speed limit for one year was adopted for new driver's license holders
	Age limit of 18 years for motor cycle driver's licenses
1.11.1974	Regulations for truck climbing lanes introduced
	The vehicle coming from a private area is obliged to yield only if indicated so by a traffic sign
	No speed restrictions for emergency vehicles
1.7.1975	Obligatory use of safety belts introduced
1.10.1976	Right-of-way for buses leaving bus stops
1.4.1977	Revision of drunken driving laws. Promille limits of 0,5 and 1,5 imposed. Gradation of punishments. Consequences of driving prohibition mitigated. Improvement of law enforcement through driver's obligation to submit themselves to an exhaling test.
1.6.1977	Obligation to use safety helmets for motor cycle drivers. Punishments for violations came into effect 1.1.1978
1.7.1978	Bus speed limit of 100 km/h in Lappland and on motorways
1.10.1978	Use of additional attention lights permitted
1.5.1980	Theoretical education in driving schools for motor cycle licence applicants

1980	Climbing lanes changed into passing lanes
1.4.1982	Stricter speed limit regulations for emergency vehicles
1.4.1982	New Act on Road Traffic



3.2
TRAFFIC EDUCATION

Driver's Licence Education

1971 The education of driving instructors was reformed and extended to nine months from the earlier eight weeks.

1979 In the education of driving instructors co-operation was started with the Teacher's Institute of Hämeenlinna. The duration of education was increased to twelve months. The contents of teaching material was entirely renewed.

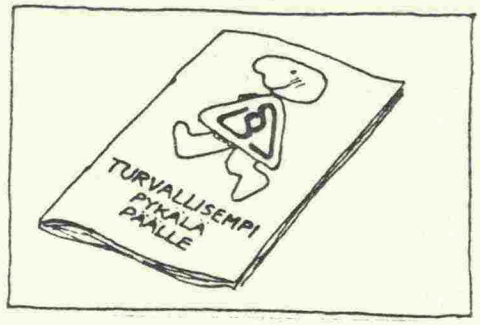
Driver training itself has developed mainly in terms of training material in the 70's.

Traffic Education in Schools

In elementary schools pupils are given traffic and traffic safety education for about 4 hours a year. At the 1st and 2nd grades education is included in environmental classes and at grades 3 - 8 it is given in connection with civics studies.

According to the directives of the Ministry of the Interior the Police District shall arrange traffic education for grades 7 - 9 for at least on hour a year. This directive came into effect in 1980.

Traffic education in schools is based on material prepared by Liikenneturva.

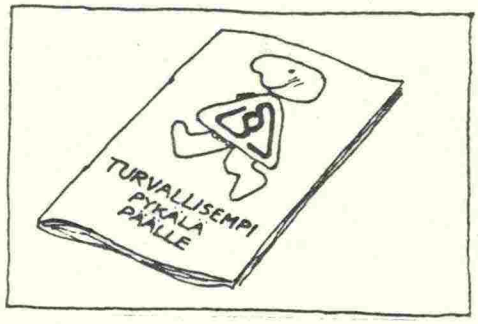


3.3 INFORMATION AND EDUCATION

Information Campaigns of Traffic Safety

The campaigns have varied in extent. Some compaigns were carried out as extensive joint projects of several organizations, and some others were executed by a single organization.

1972	"Make Safe the Child's Road"
1973	"Make Safe the Child's Road" "Unsafe Traffic" (pensioners and the aged) "Reflector -73" Overtaking Campaign ("Don't övertake your life", overtaking, bicycle and pedestrian traffic and work trip accidents)
1974	"Make Safe the Child's Road" "Unsafe Traffic" (the aged in traffic) Traffic safety of outdoor routes (in co-operation with the Association of Outdoor Sports)
1975	The week of safe urban traffic 7.4.-13.4.1975 (Helsinki, Jyväskylä, Lahti, Lappeenranta, Mikkeli, Oulu, Porvoo, Vantaa) Work trip safety
1976	
1977	"Intoxicants and traffic"
1978	"Drunken drivers are caught" "Course for anticipation in driving" "Safety helmet" "Drunken drivers are caught" "Give the old people time" "Safety in Christmas traffic" "Reflector"
1979	"Cheers and blow"
1980	"Top twenty of drunken drivers" "Save your face - use safety belts" "Green - the colour of pedestrians"
1981	"Riding bicycle in the eighties" "Are you driving under the influence "Driver - don't blow your summer away" Safety of work trips in Helsinki (co-operation of Helsinki Transit Anthority and Pohjola Insurance Company)



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Work trip safety

1976

1977 "Intoxicants and traffic"

1978 "Drunken drivers are caught"

"Course for anticipation in driving"
"Safety helmet"
"Drunken drivers are caught"
"Give the old people time"
"Safety in Christmas traffic"
"Reflector"

1979 "Cheers and blow"

1980 "Top twenty of drunken drivers"
"Save your face - use safety belts"
"Green - the colour of pedestrians"

1981 "Riding bicycle in the eighties"
"Are you driving under the influence
"Driver - don't blow your summer away"

Safety of work trips in Helsinki (co-operation of Helsinki Transit Anthority and Pohjola Insurance Company)

Television Commercials on Traffic Safety

Since the beginning of the seventies about 6 television commercials about traffic safety have been broadcast each of them for ten times. The commercials were made on the commission of Liikenneturva. Ministry of Transportation and Communication covered part on the expenses. Moreover, Alko has prepared some television commercials pertaining to drunken driving.

1978

"Course for Anticipation in Driving"
"Safety Helmet"
"Drunken drivers are caught"
"Give old people time"
"Safety in Christmas traffic"
"Reflector"
"Black ice"

1979

"Bus"
"Special transports"
"Child in the car"
"Reflector"
"Safety belts"
"Christmas"

1980

"Use of turning signal"
"Turn of the year"
"Bicycle and pedestrian traffic"
"Parent's example and children"
"Weather and tyres"

1981

"Safety on road to school"
"Reflector"
"Children's traffic song"
"Aquaplaning"

Education Material by Liikenneturva

1973

"Traffic Compass" (quide for clubs)

1975

"Educational package" (for day care centers)

1976

Safety on trips to work (educational package)
Traffic education folder for upper elementary school grades
"First grader's traffic notebook"

Traffic safety note-book for pre-school children
Initial education note-book for elementary schools

1977

Traffic safety note-book for pre-school children
Initial education note-book for elementary schools

1978

Traffic safety note-book for pre-school children
Program for traffic education in elementary schools (folder for 3rd and 4th grades)

1979

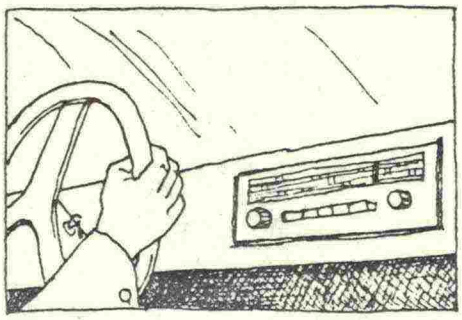
Traffic safety note-book for pupils at the 1st grade
Traffic safety note-book for pre-school children
Education folders for elementary schools (all four parts completed)

1980

Traffic safety note-book for pre-school children
Traffic safety note-book for pupils at the 1st grade
Safety on trips to work (new material in co-operation with the Centre of Occupational Safety)

1981

Traffic safety note-book for pre-school children
Traffic safety note-book for pupils in the 1st grade
The aged in traffic (education material)



Traffic Education on the Radio

Early 1970's — On hour per week of traffic education on the radio.

1973 — Traffic programs in connection of daily programs. Traffic education increased and the traffic became a topic almost every day.

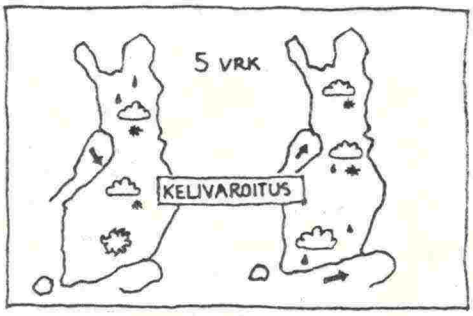
1975 — A traffic reporter was employed for the radio. Traffic education was increased, for example, in connection with "This Sunday" program.

1977 — The "In Traffic" program of every Monday morning was started.

1982 — Each Friday, during the evening rush hour, there is a one-hour traffic radio program. There is a one-hour program every Monday morning when many drivers return home from the countryside. On Sunday two hours are reserved for sports and traffic programs. If necessary, warnings for bad weather are transmitted as an extra program during the afternoon. There are also other topical traffic safety programs occassionally.

Traffic programs are listened by 600 000 - 900 000 people.

There are not regular traffic programs on television. Regular traffic programs were terminated during the mid-seventies.



3.4 WEATHER SERVICE

Public Weather Service

1969 Weather forecasts on the radio included, if necessary, a warning: "motorists are especially informed about...". This service is still continued.

1969 Each Friday a special forecast for the weekend is broadcast for road and marine traffic. In 1979 this service was merged with the weather forecast of 4 p.m.

1980 The Early Radio (local radio of the Helsinki Region) started to broadcast weather reports for the morning rush hour

1981 In connection with radio weather service there is a road weather telephone service as an experiment in the Helsinki Region.

1982 The weather service telephone operates regularly.

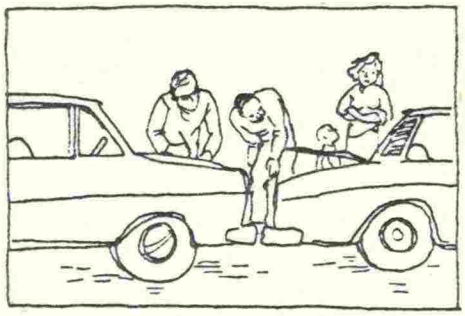
1982 There are eight daily weather forecasts on the radio (at an interval of two hours) and a regional bad weather warning by the Meteorological Institute. The forecast is broadcast in connection with the daily news. The weather forecast and warning for bad weather are broadcast also in the evening television news report.

Special Weather Service

1969 Since 1969 the road districts of Finland's Roads and Waterways Administration have been given coded weather forecasts especially for maintenance purposes.

Experiments in Turku in winter of 1980-81 and in the Helsinki Region in 1980-81 and 1981-82 were connected with the improvement of the road weather service. Even here, road district officials were primarily targeted, but weather information was also available to the Highway Police.

1981 The decentralized and more effective weather service was started in autumn in the whole country, where local air weather centers were serving road districts.



3.5
TRAFFIC AND AUTOMOBILE INSURANCE

1.1.1960	The Act on Traffic Insurance
1.1.1961	A temperance rebate (-20 %) was introduced
1.1.1965	Compensation for carrying an injured person was introduced
1.1.1967	Differentiated insurance charge (11 % of the insurance charge) was introduced
	The Traffic Safety Commission of Insurance Companies - VALT - started its work
6.6.1968	The Vehicle Repair Commission of Insurance Companies - VAT - started its work
1.1.1968	The temprance rebate was removed
1.4.1968	Possibility to restrict the traffic insurance coverage of the driver or the owner was removed
1.1.1970	Maximum insurance charge reduction of 60 % was introduced
	New insurance terms were adopted
1.1.1972	New insurance policies were placed in charge category of 120 %. Categories of 130 % and 150 % were introduced
1.1.1976	Vehicle make and model were included in the base charge of a traffic insurance policy. So-called model rate was introduced to automobile insurance policies 1.3.1968
1.10.1978	Limited vehicle damage insurance (moose damage insurance) was introduced
1.4.1978	Moose damage insurance combined with fire and theft insurance
1.5.1978	Insurance for automobile accessories was introduced
5.6.1979	Collision insurance was introduced
1.1.1980	Compensation deduction for personal injuries caused by driver's own fault was restricted to apply only to severe recklessness and drunken driving cases
1.1.1980	The base charge was made regional: charges were determined according to the community.

3.6
TRAFFIC LAW ENFORCEMENT

1973	Provinces obliged to prepare their traffic law enforcement plans
1973-74	Personnel was transferred to law enforcement duties, equipment purchased and the role of the local police increased
1977	Provincial traffic law enforcement plans were revised and patrolling intensified
1979	Annually key areas were defined for the use of traffic law enforcement plans
1980	Police districts were obliged to give traffic education in elementary schools
	Intensified patrolling for drunk drivers in May and October
1980	The volume of information was increased considerably with special emphasis on prevention of drunken driving and similar violations
1981	Intensified patrolling for drunken driving in May as in 1980.

Traffic Law Enforcement and Police Equipment

	Vechiles	M-cycles	Radars	Weigh-bridges	Cam-eras	Traffi-pax devices	Alcohol meter	Pat-rolling of High-way Police	Heli-hours
1970	756	44	10	23	2				100
1971									
1972									
1973			17	27	(88)	7			183
1974							689 000		197
1975							728 000		274
1976			24	56	(90)	10 45	724 000		3
1977						200	720 000		50
1978			30		15		749 000		50
1979			33	58	16	500	743 000		
1980						750	731 000		
1981	1 091	43	45	70	20		717 000		

Table 3.60

Measures for Improving the Safety of Special Transports

1979-80 The adaption of special transport escorting. Over 500 persons were escort trained

15.12.1980 A directive of special transport escorting was issued.

Traffic Law Violations

Fig. 3.61

DRUNKEN DRIVING CASES REPORTED TO THE POLICE

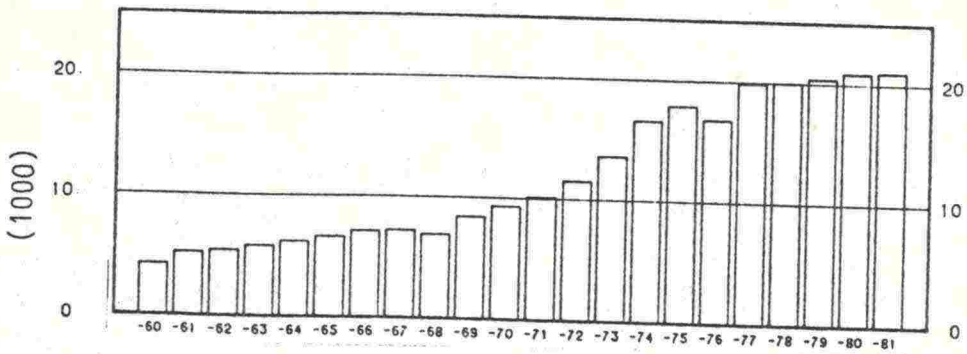


Fig. 3.62

DRUNKEN DRIVING WITH VEHICLE WITHOUT MOTOR POWER

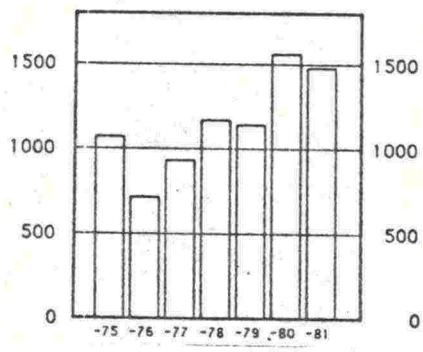
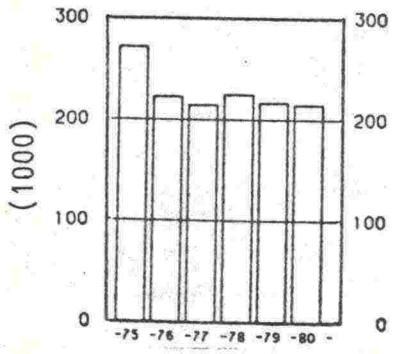
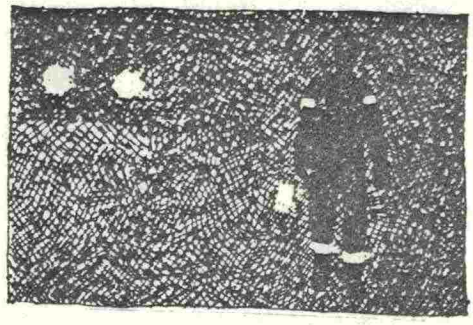


Fig. 3.63

TRAFFIC LAW VIOLATIONS





3.7
IMPLEMENTATION OF CERTAIN ROAD TRAFFIC REGULATIONS

Fig. 3.71
USE OF STUDDED TYRES IN PASSENGER CARS

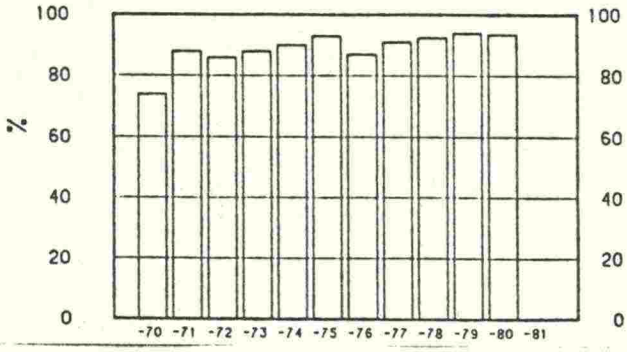
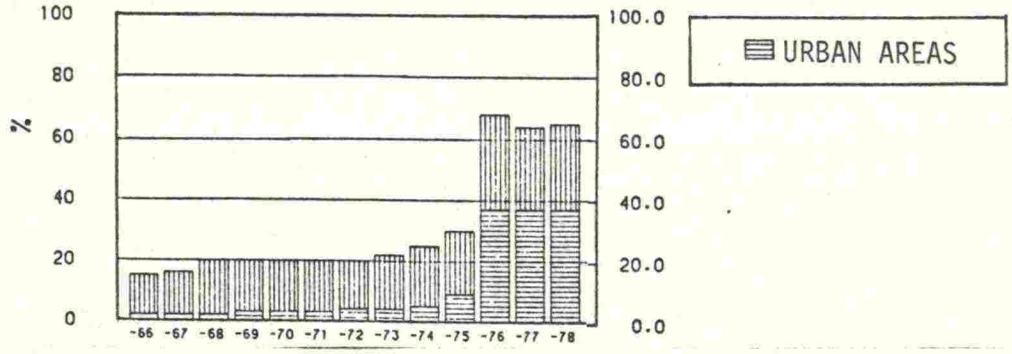
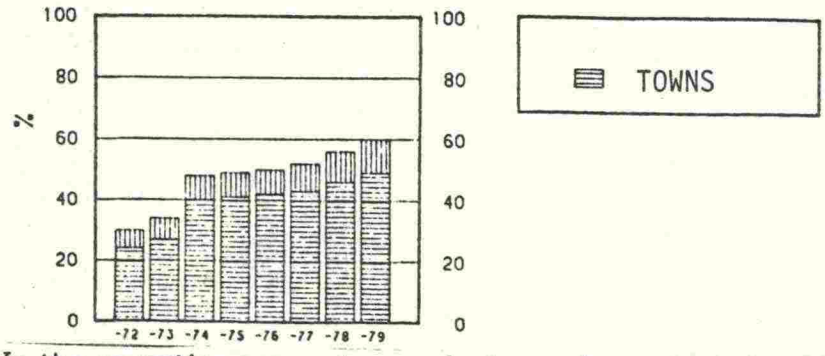


Fig. 3.72
USE OF SAFETY BELTS ON HIGHWAYS AND IN URBAN AREAS



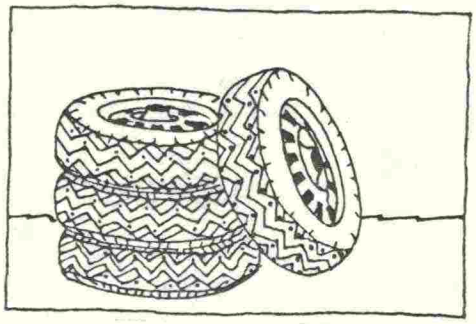
In 1980, 58 % of drivers used safety belts on highways and 21 % in urban areas. The figures for May, 1982, were 86 % and 67 %, respectively.

Fig. 3.73
PEDESTRIAN'S USE OF REFLECTORS IN URBAN AREAS



In the seventies garment manufacturers have started providing sports clothing with reflecting material.

4. MEASURES AIMED AT VEHICLES



4.1
VEHICLE REQUIREMENTS

Issuance Dates of Regulations for Vehicle Techonology

1.1.1968	Device for preventing unpermitted use of vehicle
1.10.1970	Mandatory use of headlights in winter
1.1.1971	Sign indicating the lenght of truck combinations
	Rear bumper for trucks
	Mandatory installation of safety belts in the front seats
1.3.1972	Advance warning triangle as an obligatory accessory
1.7.1973	Changes in vehicle speed limits
1.1.1975	Act and statute on transports of dangerous materials
1.9.1974	Stud force of studded tyres was limited
1.9.1974	Use of studded tyres permitted only in winter
	Prohibition to use mixed tyres when using radial and studded tyres
1978	Regulations of Ministry of Transportation and Communications for transport of dangerous materials
1.5.1978	Mandatory installation of driving recorder in some classes of trucks and buses
1.10.1978	Use of additional attention lights permitted
1.12.1978	Mandatory use of snow tyres for the three winter months
1.4.1979	Allowable stud force of studded tyres was reduced
1.1.1981	The following structural parts of automobiles shall conform to the E-regulations or equal requirements
	Seat anchorages
	Head restrains
	Windshield lamination

Dual circuit brakes

Washing device for headlights

Steering impact protection for absorbing the collision energy of a car

Strenght requirements for door hinges and latches

Requirements for reducing fire hazard
Requirements for the sight view of mirrors

Device for window defrosting

Devices for defrosting and defogging of rear windows

Mandatory installation of safety belts in back seats

1.4.1982 Mandatory use of headlights throughtout the year

4.2
VEHICLE INSPECTION

Development of Vehicle Inspection

1968 Inspections were assigned to the Automobile Registration Centre, which started to rent appropriate space. Also the construction of inspection centers was started

1972 There were 41 vehicle inspection centres

1982 There were 57 vehicle inspection centres

The inspection halls are provided with an inspection pit or a vehicle-lifting device and front axle jacks. There also is a brake dynamometer and headlight testers.

New Inspection Facilities

	Inspection halls and test stations	
1974	2	18
1975	1	1
1977	7	30
1979	3	12
1980	4	14
1982	6	20

1982 All but one vehicle inspection center has an adequate inspection hall.

The capasity of an inspection center can be calculated so that one test station corresponds to 10 000 - 20 000 annual inspections.

5. MEASURES PERTAINING TO TRAFFIC ENVIRONMENT

5.1
TRAFFIC SAFETY MEASURES IN URBAN AREAS

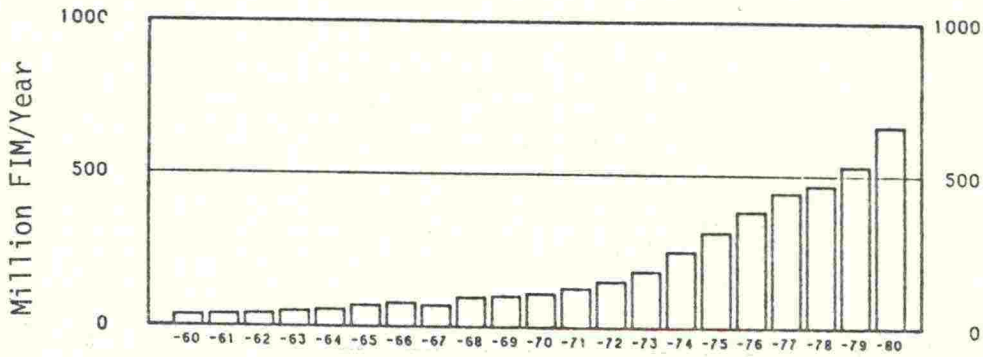
Several cities, such as Helsinki, have pursued traffic safety for a long time. However, there are no statistical data or other information about traffic safety measures implemented in urban areas. As a consequence this report deals only briefly with urban traffic safety measures. On might say, however, that several measures aimed at the traffic environment in general also affect the urban areas.

Renovation of transportation in city centres have been undertaken to some degree in about ten cities. Even medium-size and minor towns are planning central-controlled traffic signal systems.

A few cities have special lanes for buses.

About 50 cities and villages have made or are in the process of making traffic safety plans, which cover the street and road network. The implementation of measures presented in those plans is only in the starting phase.

Fig. 5.11
MUNICIPAL FINANCING OF ROAD, STREET AND BRIDGE MAINTENANCE



Number of signalized intersections on streets and public roads

1960	about	30 intersections
1970	about	200 "
1978	about	600 "
1982	about	950 "

5.2
TRAFFIC SIGNS AND GUIDANCE OF TRAFFIC

Guidance System of Public Roads

1964 - 66	stage I	Intersections of two primary roads, a primary road and a secondary road, and two secondary roads. Destination sign, simplified destination sign. Road sign.
1964 - 66	stage II	Intersections of a primary road and a rural collector road, and a secondary road and a rural collector road. Destination sign, simplified destination sign, road sign.
1967	stage III	Intersections of two rural collector roads and a local road and a rural collector road. Exceptionally a destination sign and a simplified destination sign, road sign.
1968	stage IV	Intersections of a rural collector road and a local road, and two local roads. A road sign.

Numbering of Routes

1970	stage I	Destination signs and simplified destination signs provided with route numbers
1971 - 72	stage II	Separate number signs erected at the intersection of rural collector roads and local roads. Europe Route numbering.
1975		Instructions for overhead signs
1982		New traffic sign manual
1978 - 80		Signing of first-aid stations. Guidance to about 60 hospitals and 140 health centres.

New or Revised Traffic Signs

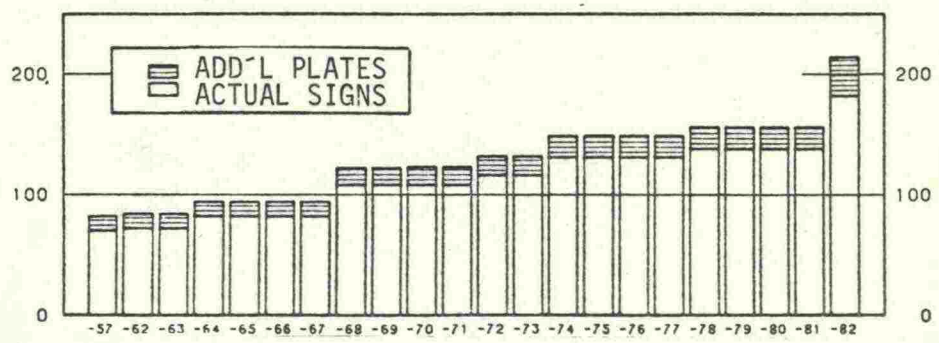
1.1.1965	Motorway signs. A new destination sign. Blue-and-white sign also on other roads. Simplified destination signs. A distance sign.
	The traffic signing system of public roads was implemented.
1.10.1968	Warning signs: "traffic circle", "signals ahead", advance warning sign of pedestrian crosswalk, "two-way traffic", "slippery road", "loose stones".
	"Yield to opposing traffic", and "pedestrians prohibited". Lane guidance, pedestrian signals.
1.1.1969	New signs for "no stopping" and "no parking".
4.6.1971	Stop sign was renewed.
1.1.1972	Additional sign for turning traffic having the right-of-way.
	Bus and tram lanes.
1.12.1974	New signs: "Bend", "intersection", "crossing of minor road", "child", "ferry quay", "bicycle". White edges for blue signs. New crosswalk sign. Climbing lane sign. Route guidance, bicycle riders guidance, sign for guiding pedestrians. Some new additional signs.
1.7.1978	New signs: "moose", "ski trail", "low flying aeroplanes", "emergency telephone".
1.4.1982	Fifty entirely new traffic signs were taken into use as well as 13 additional signplates. Eleven old signs were abandoned. The symbols of old signs altered in 21 cases.

Traffic Sign Installations

1969-1972	At private road intersection, right-of-way was indicated by signs. More than 30 000 traffic signs were used for this purpose.
Early 1970's	At intersections of public roads, right-of-way was indicated by traffic signs.
1971	Signing of pedestrian crosswalks was improved.
1970-s	Portals and overhead signs were taken into use.
2.4.1982	Letter of Ministry of Transportation and Communications concerning the signing of right-of-way.

Fig. 5.21

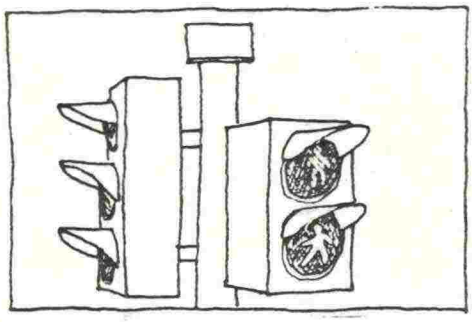
NUMBER OF VARIOUS TRAFFIC SIGNS AS SET FORTH IN STATUTES AND MINISTERIAL DIRECTIVES



In 1982 there were also about 15 traffic signs confirmed by Finland's Roads and Waterways Administration.

Reflectivity Requirements of Traffic Signs

1957	Traffic signs "Unguarded Railway Crossing", "Guarded Railway Crossing" and "Stop" at an intersection shall be illuminated in the dark or provided with a reflector or reflective film.
1.1.1965	Traffic signs "Motorway" and "End of Motorway" shall be provided with a reflective film or illuminated in the dark.
1.12.1974	"Approach Signs of Railway Grade Crossing" shall be illuminated in the dark or provided with a reflective film. If a traffic sign is reflective, the colours of additional signs shall also be reflective.
25.8.1980	Finland's Roads and Waterways Administration and the Union of Finnish Cities issued similar directives for the reflectivity properties of traffic signs and for the choice of different reflective film materials. The directives prescribe, among others, when highly reflective film shall be used.
1.4.1982	A traffic sign that is not illuminated shall be provided either entirely or for sufficient parts with special reflective film so that the sign may be seen and recongnized at a sufficient distance in the dusk or dark, unless it is otherwise required.



Regulations for Traffic Signals

1.7.1978 General traffic signal directions were issued which, among others, included the following:

At intersections all directions of traffic flow shall be controlled by traffic signals

In addition to the main signal face there shall also be a secondary signal face

Regulations for locating the main signal and the secondary signal faces

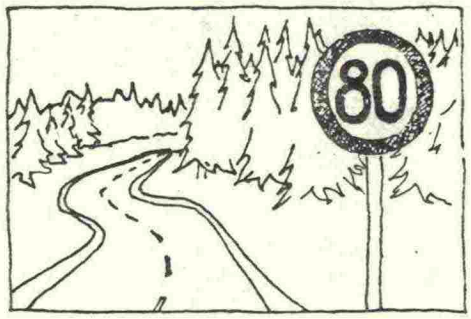
The phases and phase duration of signals

Installation of two pedestrian signals on the same side of the crosswalk

Signal phase split for intersecting traffic flows

Use of green arrow

1.4.1982 Bicycle sign was issued.



5.3
SPEED LIMITS ON PUBLIC ROADS

Road Section Speed Limits

1.8.1973	The 1st stage started in the 7 southernmost provinces mainly on primary and secondary roads. Free speed and local limits on other roads remained.
21.12.1973	"Energy Saving Speed Limit" of 80 km/h for the whole road network, excluding sections with lower local limits.
1.7.1974	the 2nd stage was started in the whole country. New sections of roads were included in the sectional speed limit system and the number of 120 km/h speed limit sections was reduced. For roads outside the system a speed limit of 80 km/h (basic speed) was adopted beyond the lower local speed limit areas.
1.7.1975	The 2nd stage was revised and extended by incorporating into the system so-called 60 km/h roads. Speed limits of 100 km/h were lowered for research purposes.
1.7.1976	The 120 km/h speed limit remains only on motorways. The bulk of the roads of the 60 km/h experiment was returned to the basic speed limit system.
1.10.1976	Road section speed limits were revised in the whole country. 100 km/h limits were lowered. New and improved road sections were included in the system.
1.4.1978	Decisions regarding so-called local speed limits within the general speed limit system were to be made by Finland's Roads and Waterways Administration. Local speed limits (50, 60 km/h) cover about 4 000 km of roads.
1.7.1978	Sectional speed limits and basic speed were made permanent. 100 km/h speed limits in Lapland were increased and some new roads were incorporated into the speed limit system.
July-August 1980	Sectional speed limits were revised in the whole country. Changes were based on new road and traffic conditions, completed road improvements and accident trends. Special attention was paid to the safety of road section within the 100 km/h speed limit.
1.4.1982	The authority for the sectional speed limit decisions was transferred from Ministry of Transportation and Communications to Finland's Roads and Waterways Administration (revision of road traffic legislation).

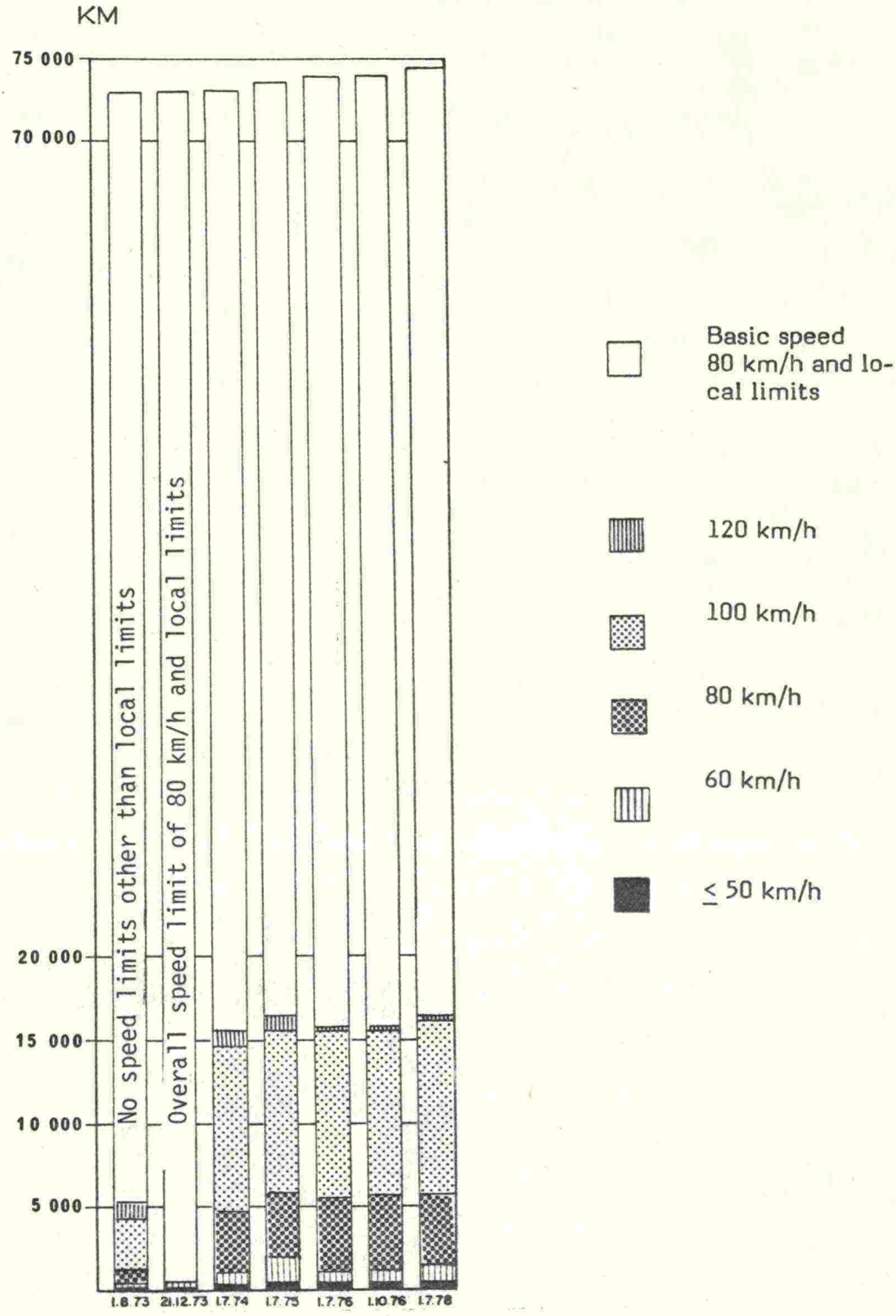


Fig. 5.31
Speed limit categories on public roads at various stages of the speed limit experiments and thereafter

Road Section Speed Limits on Public Roads, January 1st, 1982

Speed limit km/h	Primary&secondary roads km	%	Other highways and local roads km	%	Total km	%
120	129	1.2	-	-	129	0.8
100	8022	71.9	3120	59.8	11142	68.1
80	2648	23.7	1496	28.7	4144	25.3
60	300	2.7	492	9 4	792	4.8
50	52	0.5	108	2.1	160	1.0
Total	11151	100.0	5216	100.0	16367	100.0

Local speed limits on approx. 4 200 km of public roads.
Overall speed limit of 80 km/h on approx. 54 600 km of public roads.

Road Section Speed Limits by Speed Designation

Speed limit	1.8.73 %	1.7.74 %	1.7.75 %	1.10.76 %	1.1.77 %	1.1.78 %	1.7.78 %	1.1.79 %	1.1.80 %	1.1.81 %
120	19	5	5	0.9	0.9	0.9	0.9	0.9	0.8	0.8
100	56	62	60	64.5	64.7	65.3	65.6	66.1	66.5	67.2
80	18	22	23	26.3	26.3	25.8	25.5	25.2	25.1	24.8
60	4	6	10	5.9	5.9	5.9	5.9	5.8	5.6	5.3
≤ 50	3	2	2	2.2	2.2	2.1	2.1	2.0	2.0	1.9
Average road section speed limit km/h										
	98.4	93.4	91.2	91.5	91.5	91.6	91.7	91.8	91.9	92.1

A section specific speed limit is a limit within the national speed limit system where the highest permissible speed is defined for each road or route section separately based on road and traffic conditions and taking local conditions into consideration. A sectional speed limit is indicated by traffic signs (so-called differentiated speed limit).

5.4
CONSTRUCTION OF ROADS AND BRIDGES FOR BICYCLE AND PEDESTRIAN TRAFFIC

In 1975 the over-all lenght of bicycle and pedestrian paths in urban areas and on public roads was 1 800 km. In 1980 the respective lenght was 3 900 km.

The overall number of over- or underpasses for bicycles and pedestrians in urban areas and on public roads was 490 in 1975 and 1 040 in 1980.

Construction of Roads and Bridges for Bicycles and Pedestrians on Public Roads

Fig. 5.41
CONSTRUCTION OF PEDESTRIAN AND BICYCLE PATHS

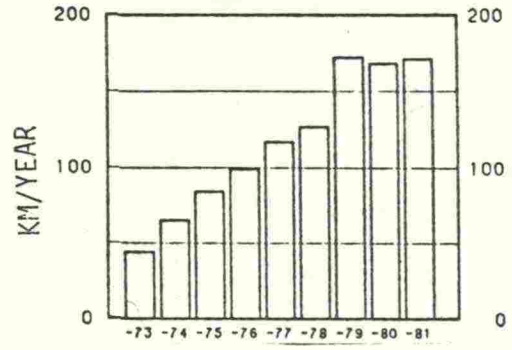


Fig. 5.42
CONSTRUCTION OF SIDEWALKS

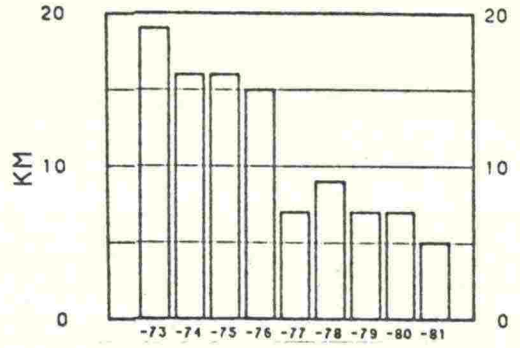
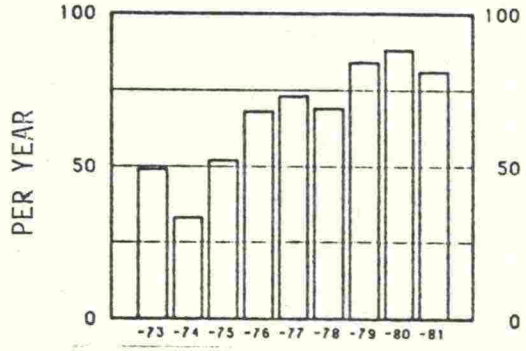


Fig. 5.43
CONSTRUCTION OF OVER- AND UNDERPASSES FOR BICYCLES AND PEDESTRIANS



5.5
MEASURES PERTAINING TO PUBLIC ROAD INTERSECTIONS

Fig. 5.51
CHANNELIZATION

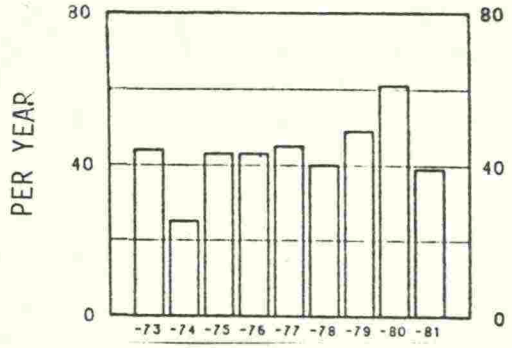


Fig. 5.52
GRADE SEPARATIONS

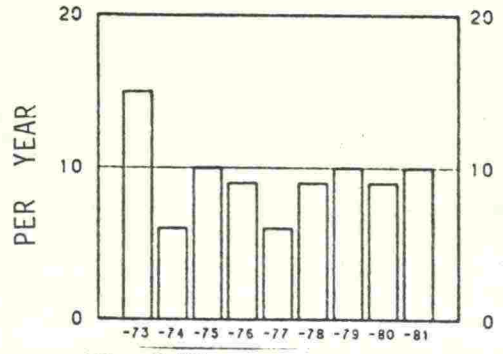


Fig. 5.53
OTHER IMPROVEMENTS

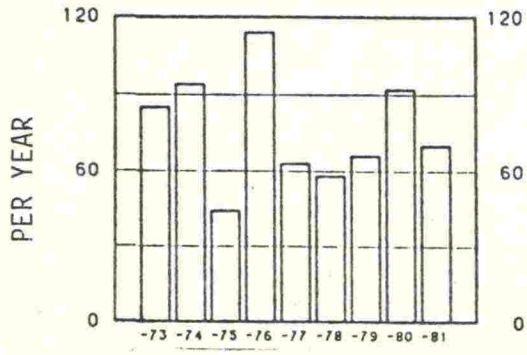
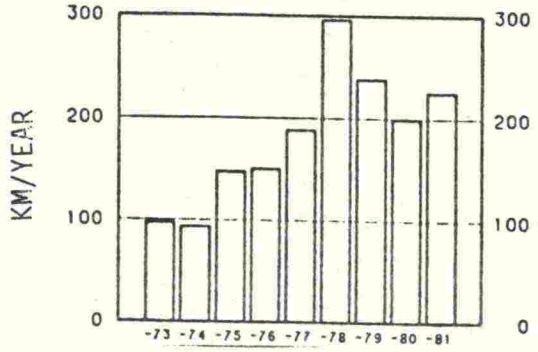


Fig. 5.54
PRIVATE ROAD ARRANGEMENTS
FOR ACCESS CONTROL PURPOSES)



5.6
MEASURES PERTAINING TO RAILWAY GRADE CROSSINGS

Grade Crossing and Protective Devices in 1980

Road class	Number of grade crossings	Protective devices				
		No protective devices	Flashing light and signal	Gates (half. width)	Gates (full width)	Total
Public roads	750	315	140	290	5	435
Streets and urban roads	400	185	110	100	5	215
Private roads	7250	7 210	10	30	-	40
Total	8400	7 710	250	420	10	690

Grade Crossings on the Entire Railway System

Fig. 5.61
GRADE CROSSINGS REMOVED

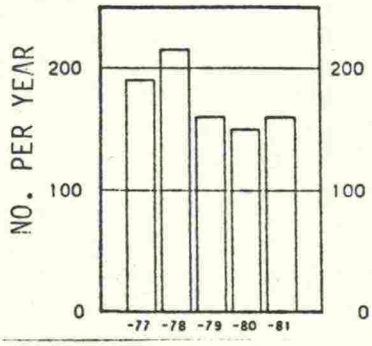
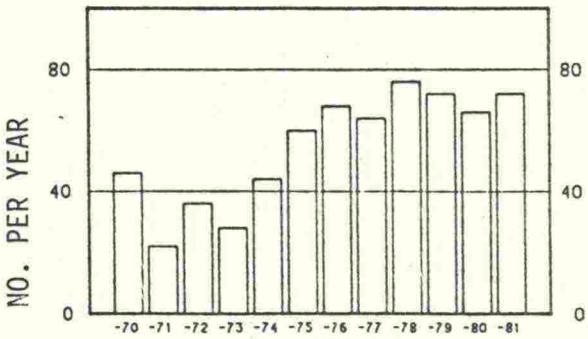


Fig. 5.62
PROTECTIVE DEVICES INSTALLED



Grade Crossings on Public Roads

Fig. 5.63
CONSTRUCTION OF GRADE SEPARATIONS

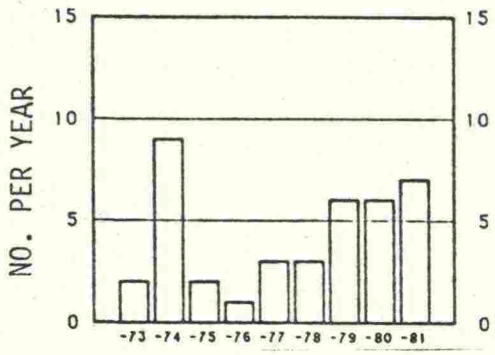
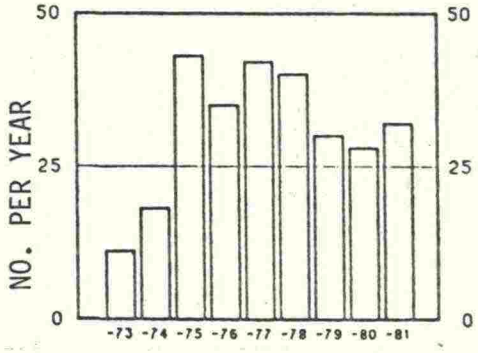
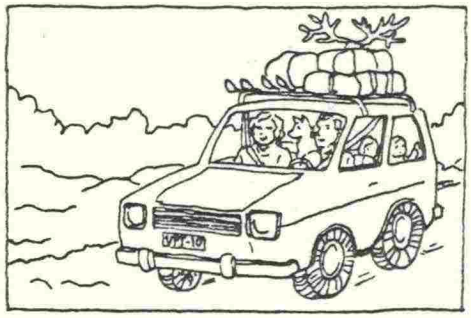


Fig. 5.64
GRADE CROSSINGS PROVIDED WITH SAFETY DEVICES





5.7
SOME MEASURES ON PUBLIC ROADS

Climbing Lanes on Public Roads

1976	20 each
1982	36 each

Parking and Rest Areas on Public Roads

1968	480 parking areas and 70 rest areas
1975	1 600 parking areas and 300 rest areas
1980	2 000 parking areas and 350 rest areas

Emergency Telephones

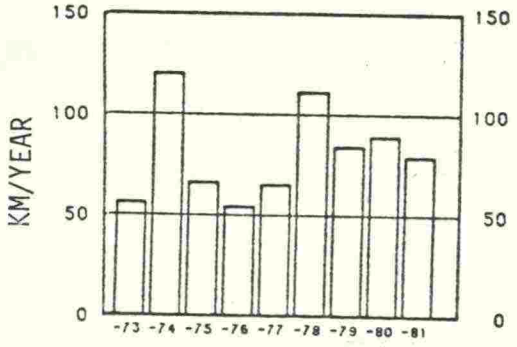
1975	There were 117 emergency telephones installed over the total lenght of 332 km roads.

Guardrails

Some motorway sections are equipped with guardrails on medians. Steel guardrails have been taken into use on main roads and the beam ends are buried into the ground.

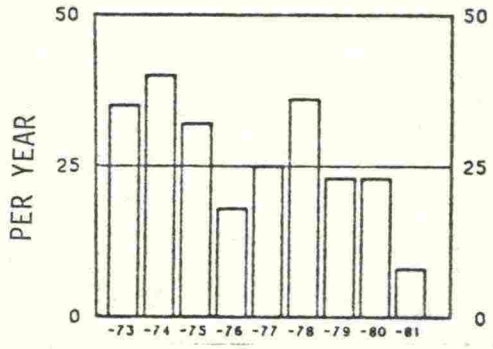
Construction of Lighting on Public Roads

Fig. 5.71
ROADWAY LIGHTING



In 1967 the total lenght of illuminated public roads was 4 100 km and in 1982 5 560 km.

Fig. 5.72
INTERSECTION LIGHTING



Directions for the Use of Roads and Roadsides

20.5.1970	Directions for the access control of hotels and restaurants along the road
9.11.1070	Directions for the access of camping sites
4.4.1974	Directions for the access control of roadside vendor stands
27.1.1975	Directions for traffic control measures at underground conduit construction sites.
27.5.1975	Directions for the traffic control of construction areas
25.9.1975	Directions for the roadside excavation
25.11.1976	Directions for the location and access control of service stations
14.8.1978	Directions for the traffic control of construction sites (new)
1979	Directions for transport and storage of timber
26.5.1981	Directions for special use of roads
1.9.1981	Directions for special transport operations and the warning devices

5.8
MAINTENANCE OF PUBLIC ROADS

Development and Volume of Certain Maintenance Operations

Fig. 5.81

WINTER SANDING OF PUBLIC ROADS

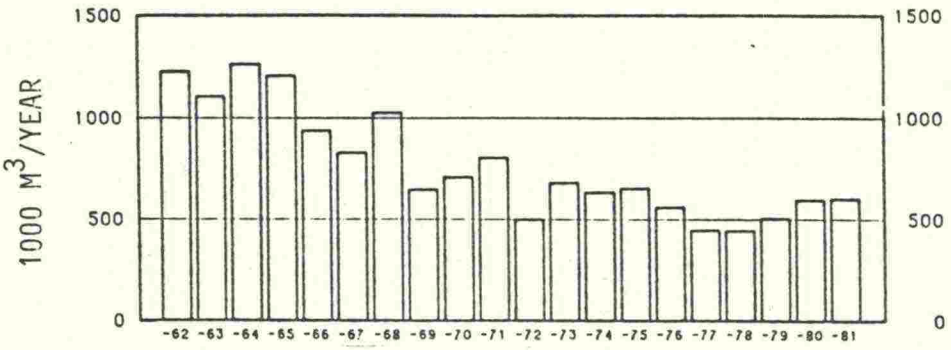


Fig. 5.82

WINTER SALTING OF PUBLIC ROADS

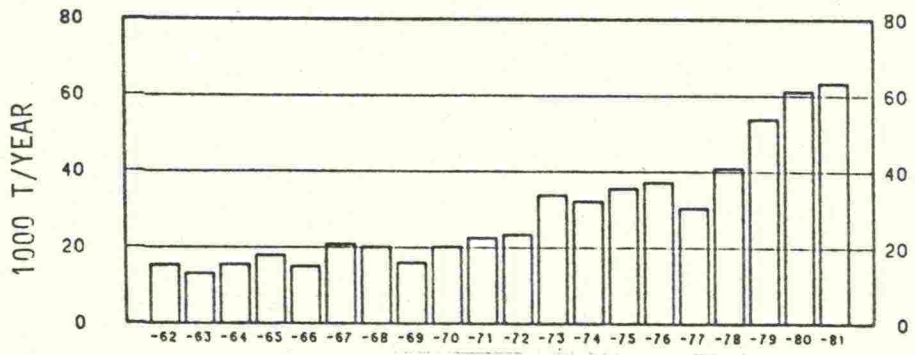


Fig. 5.83

USE OF PAVEMENT MARKING PAINTS

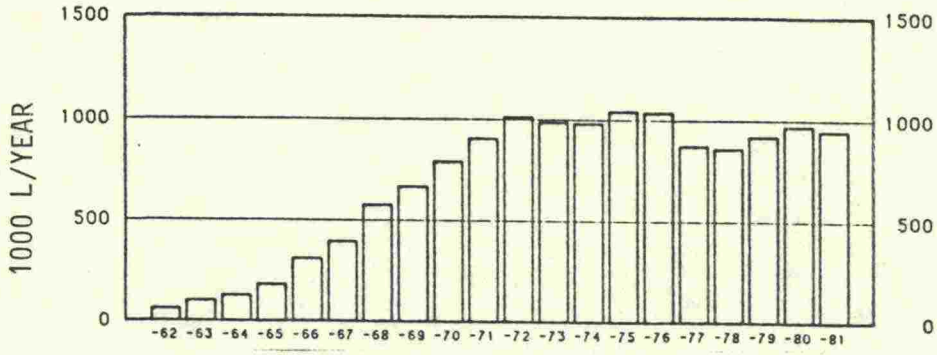
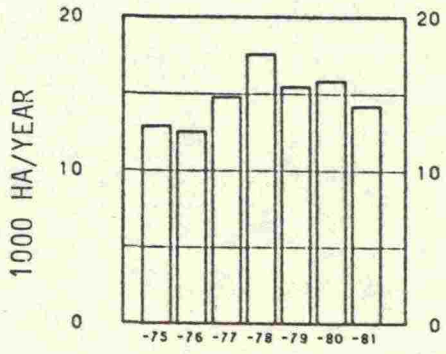


Fig. 5.84

REMOVAL OF UNDERBRUSH
FROM ROADSIDES



Development of Weather and Road Condition Observations for the Roadway Maintenance of Finland's Roads and Waterways Administration

Weather observations have been made since the 1950's. In that system the weather conditions were observed by equipment operators and the start of work was based on operator's own initiative until the year 1970.

1969 The Meteorological Insitute started the weather service for the road districts in the form of coded reports.

1970 Road masters were obliged to be on emergency call during weekends. The start of the maintenance work was to be decided by the roadmaster. Observations of weather were still made by the equipment operators.

1974 In some roadmaster districts night duty was introduced.

1980 The duty system was entirely revised starting from autumn.

Night shifts were taken into use. Recommended time 03.00 -07.00 a.m. and shifted working hours from 05.00 a.m. to 07.00 a.m.

Roadmasters had to be available for duty on the basis of a calendar week (7 days).

The observation of weather was changed so that the task is designated to one person of the roadmaster district at a time.

Night duty was started in 27 roadmaster districts (ADT more than 2 000 vehicles).

1981 In the autumn an extensive weather observation training project was carried out in all road ditricts in co-operation with the Meteorological Institute.

1981 In the autumn the weather reports of the Meteorological Institute were changed into common language and the forecasting was changed into regional operations based in Helsinki, Tampere, Kuopio and Rovaniemi. Improving the accuracy of the forecasts was the goal of these measures.

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